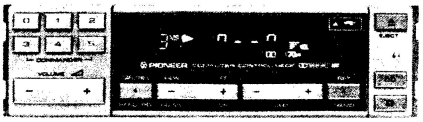
PIONEER

Service Manual



The photo shows the model FX-K5/EW

ORDER NO.
CRT-469-0

CENTRATE COMPONENT CAR STEREO CASSETTE DECK

FX-K5SDK WG
FX-K5B EW
FX-K5 EW

- **Cassette Mechanism Assembly**

See the Service Manual CX-156/A (CRT-468) when servicing the cassette mechanism assembly.

SPECIFICATION

General

Power source	DC 14.4V (10.8 ~ 15.6V allowable)
Grounding system	Negative type
Dimensions	180(W)×50(H)×168(D)mm
(chassis)	178(W)×50(H)×175(D)mm (FX-K5B)
(front face)	188(W)×58(H)×25(D)mm (FX-K5B)
Weight	1.4kg
Tone controls (bass)	±10dB (100Hz)
(treble)	±10dB (10kHz)
Maximum output level	200mV
Output impedance	2kΩ

Tape Player

Tape	Compact cassette tape (C-30~ C-90)
Tape speed	4.76cm/sec. (+0.14cm/sec., −0.05cm/sec.)
Fast forward/rewind time	Approx. 100 sec. for C-60
Wow & flutter	0.09% (WRMS)
Frequency response	Metal: 30 ~ 20,000Hz (±3dB)
	Normal: 30 ~ 17,000Hz (±3dB)
Stereo separation	45dB
Signal-to-noise ratio	Dolby NR IN: 63dB (IEC-A network)
	Dolby NR OUT: 55dB (IEC-A network)

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

- Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

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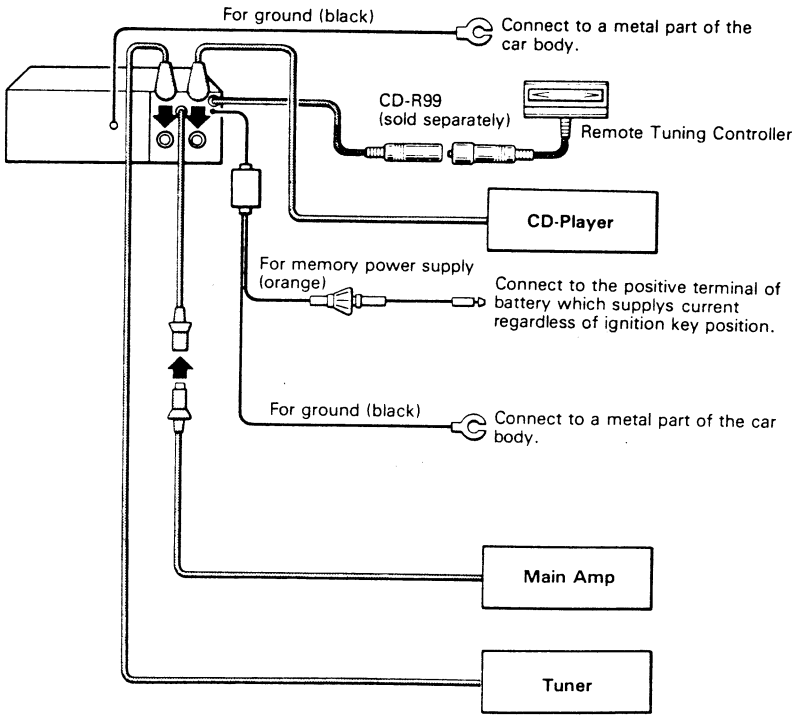
1. CONNECTION


For ground (black)
Connect to a metal part of the car body.
CD-R99
(sold separately)
Remote Tuning Controller
CD-Player
For memory power supply
(orange)
Connect to the positive terminal of battery which supplys current regardless of ignition key position.
For ground (black)
Connect to a metal part of the car body.
Main Amp
Tuner

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

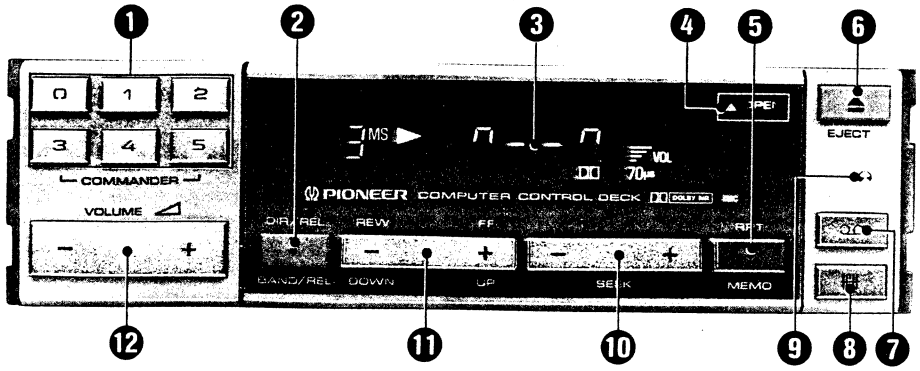
City/State/Zip :

Please send this form filled to the distributor in your country.

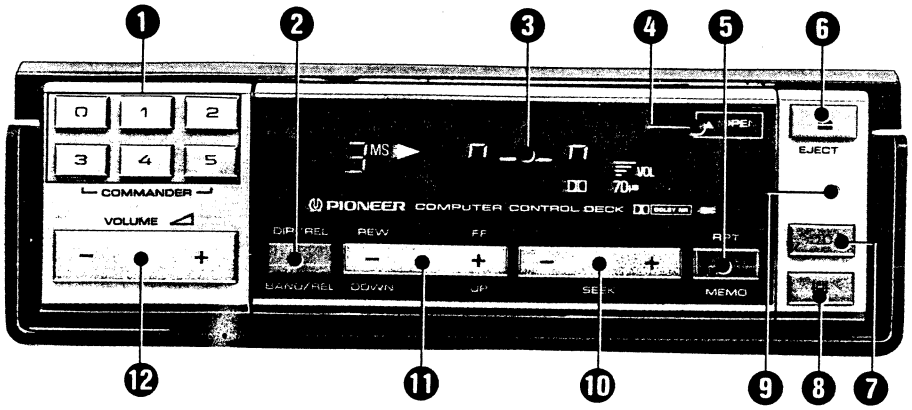
2. OPERATION

(Front section)

FX-K5/EW

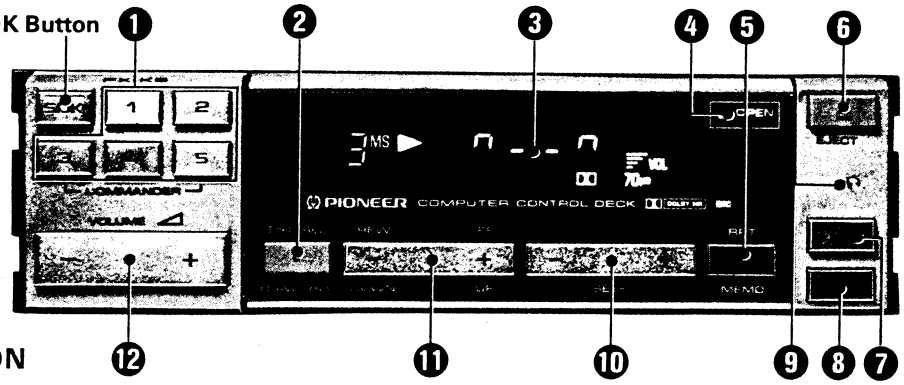


FX-K5B/EW



SDK Button

FX-K5 SDK/WG



2.1 TAPE SECTION

❶ Command Button

Press the command button to set the number of recorded selections to be skipped or to set the number of times a piece is to be repeated.

❷ Program Switching/Release Button

Press this button to switch from side A to side B and vice versa. Also, you can press this button to cancel music search, repeat, skip search, and fast forward or rewind.

❸ Display

❹ Open Indicator

Flip-down control panel opens when pressed.

❺ Music Repeat Button

Press this button to hear the piece you are listening to as many times as you wish. Also, with the repeat command set, the piece will play as many times as the number you have set. To cancel music repeat, press the release button or music repeat button one time.

❻ Eject Button

Use this button to eject the cassette from the unit.

❼ Tape Power Switch

Press to stop the play of a selection. Pressing again will supply power and cause the tape to continue from the position at which it stopped.

When switching to the tuner (sold separately), pressing the tuner power switch without turning the deck off will switch from the deck to the tuner.

❽ Tuner Power Switch

❾ Clear Button

Press this button with a pointed rod if the tape running should by chance malfunction (incorrect display, etc.). After several seconds, tape running will return to normal.

❿ Seek Button

⓫ Fast Forward Button (+)/Rewind Button (−)

Press the (+) side for fast forward or the (−) side for rewind. For music search, press this button twice.

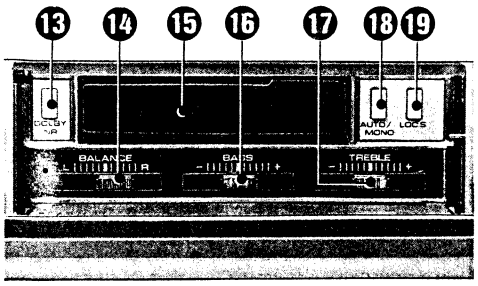
⓬ Volume Increase Button (+)
Volume Decrease Button (−)

Press the (+) side to increase volume (soft → loud) or the (−) side to decrease volume (loud → soft). The button has 34 levels for adjustment. Each time you press the button, the volume level increases or decreases accordingly. Hold the button and the volume will increse or decrease continuously.

• Nomenclature and Use

• Nomenclature and Use

(Flip-Down Control Panel Section)



⑬ Dolby NR Button

Press this button to play a tape recorded on a Dolby NR system. (DD will light up on the display.)

⑭ Balance Control

⑮ Cassette Insert Slot

Insert the cassette into the loading slot with the playing edge (the edge where the tape is exposed) to the right, and the deck will set the cassette automatically.

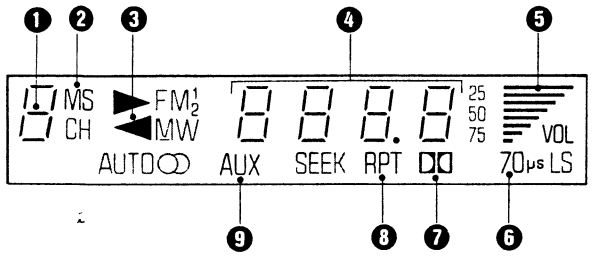
⑯ Bass Control

⑰ Treble Control

⑱ Auto/Mono Switching Button

⑲ Local Station Button

• Reading the Display



❶ 8 : Number of Times to Skip or Repeat

The number corresponding to the commander button pressed to set the number of recorded sections to skip in skip search or the number of times to replay in music repeat is displayed.

- For music repeat, the number of repeats is set and the display changes as shown in the following figure.

Example: Set repeat for 2 times

Set → 2 → 1 → Clear → Return to normal tape play

❷ MS : Skip Search/Music Search Display

MS display lights when skip search or music search is operating.

- For skip search, the display changes as shown in the following figure.

Example: To find the beginning of the second selection before the one being played.

Set → 2 MS → 1 MS → 0 MS → Clear → Tape play

Example: To find the beginning of the second selection following the one being played.

Set → 2 MS → 1 MS → Clear → Tape play

- For music search, the display changes as shown in the follwoing figure.

Find the beginning of the presently playing piece.

Set → 0 MS → Clear → Tape play

Find the beginning of the next piece following the presently playing piece.

Set → 1 MS → Clear → Tape Play

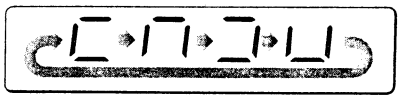
❸ ▶ ◀ : Tape Play Indication

When playing back upper tracks ▶ mark appears and when lower tracks are played back, ◀ mark appears.

❹-1 8888 : Tape Play, Fast Forward/Rewind Indication

When the ▶ mark appears, tape travel is in the normal direction and the mark rolls in the direction shown in the following figure: (counterclockwise)

When the ◀ mark appears, tape travel is in the reverse direction and the mark rolls in the direction shown in the following figure: (clockwise)



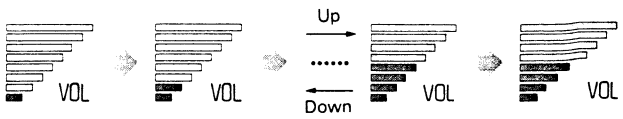
During fast forward and rewind, speed of rotation of the mark is faster. During fast forward, the mark rolls in the normal direction. During rewind, the mark rolls in the reverse direction.

❹-2 8888 : ATSC (Automatic Tape Slack Canceler) Display

When a cassette is set in the deck, the tape slack is taken up automatically. At this time _ _ display flashes.

❺ VOL : Volume Level

Press the volume button and the volume level is indicated in yellow steps from 1 to 19 and red steps from 20 to 34. Volume level change is indicated as shown in the following figure. The symbol is always lit.



❻ 70μs : 70μs Tape Display

Insert a cassette tape and the auto tape selector will automatically switch the equalizer (70μs/120μs). If it is a 70μs tape, the 70μs display will illuminate. If it is a 120μs tape, there is no display.

❼ DD : Dolby NR Display

Press Dolby NR button to listen to a tape recorded on Dolby NR. DD display will illuminate.

❽ RPT : Music Repeat Display

Press music repeat button and RPT display will illuminate to indicate the function.

❾ AUX : External Input Display

With this set OFF and another unit connected by external input jack (Compact Disc Player, etc.), operating, AUX display will illuminate.

• Playing

1. Press the [▲ OPEN] ❹ indicator and the flip-down control panel will open.
2. Insert a cassette tape into the slot ⓯ and the deck will load the cassette automatically to play the tape.
3. Press Dolby NR button ⓭ to listen to your tapes recorded on Dolby NR system.
4. Adjust volume ⓬, balance ⓮, bass ⓰ and treble ⓱ controls as you like.
5. Close the flip-down control panel.
6. To stop a tape, press the tape power switch ❼. Press the switch again, and play will begin at the place where it was stopped.
7. To eject the cassette from the unit, first press the [▲ OPEN] ❹ indicator to open the flip-down control panel. Next press the eject button ❻ to eject the cassette.

Note:

- When the flip-down control panel is open, do not use excessive force to the panel so as not to damage it.
- 4 seconds after a cassette is set, the cassette ejects automatically because the set condition is not correct. In this case, check for tape damage.
- 4 seconds after pressing the eject button, the cassette does not eject but starts to play again. If the cassette still does not eject after three attempts, stop all equipment. If the condition should occur again, contact the dealer where you bought the deck or your nearest Pioneer Service Station for repairs.

2.2 TUNER SECTION

❶ Station Preset Button

A total of 12 FM stations (6 under FM1 and 6 under FM2), 6 MW stations and 6 LW stations can be preprogrammed into memory using this button. Once in memory, these 24 frequencies are available for tuning at the touch of a button.

❷ Band Switching/Release Button

Pressing this button will switch to the next band in the following order: FM1 → FM2 → MW → LW → FM1. This button also works to cancel a seek tune frequency.

❸ Display

❺ Memory Button

❽ Tuner Power Switch

Press this button to turn on power to the tuner control section. Press the button again to turn power off.
Also, when you want to listen to a tape, press the tape power switch directly and tape play will be selected instead of the tuner.

❾ Clear Button

If something goes wrong (display is incorrect, etc.) while you are listening, press this button with a pointed rod. After several seconds, operation will return to normal. Remember that when you press this button, all preset frequencies entered into memory are erased and programmed function settings are cleared so you should make settings again as desired.

❿ Seek Button

Pressing the (+) side of this button automatically advances the tuning to the next higher frequency, while pressing the (−) side tunes to the next lower frequency.

⓫ Tuning Button

Press the (+) side (low → high) or the (−) side (high → low) to adjust the station frequency setting.

⓭ Auto/Mono Switching Button

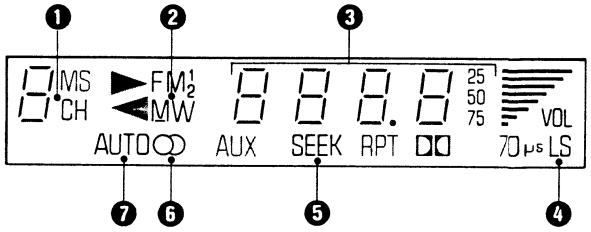
This button functions during FM broadcasts. Generally this button is pressed and left in the AUTO setting. (Note: The word AUTO is illuminated on the display in this setting.) In this position the unit will automatically switch to high quality stereo when a strong signal is present, and to the optimal reception condition should the signal weaken or to monaural when a very weak signal is present.
Pressing the button once more (Note: the illuminated AUTO will disappear from the display) will allow reception of frequencies regardless of their strength, in monaural.

⓯ Local Station Button

Use this button to change the seek threshold level of the seek function. Normally, this button is kept in the OFF position. At night, when radio signal conditions are favorable, very weak signals are often detected and sought out by the seek function. Pressing this button (Note: LS will illuminate on the display) will raise the seek threshold level to eliminate this problem.

- All the press type control buttons have an electronic sound (beep) and display for dual checking to confirm operation.

• Reading the Display (FX-K5, FX-K5B)



❶ CH : Channel Number Display

Press the station preset button and the number of preset channel is displayed.

❷ FM1/2/MW : Band Display

Pressing the band switching button will let you select and display the band you desire (FM1 → FM2 → MW → LW → FM1). Select FM1 or FM2 to listen to an FM broadcast, MW to listen to an MW broadcast and LW for LW broadcasts.

❸ 25/50/75 : Frequency Display

When the tuner is turned on, each band can be displayed over the following frequency ranges: FM = 87.5∼108MHz, MW = 531∼1,602kHz, LW = 153∼281kHz.

❹ LS : Local Station Display

Press local station button and LS display will illuminate to indicate the function.

❺ SEEK : Seek Display

Press seek button and SEEK display will illuminate to indicate the function.

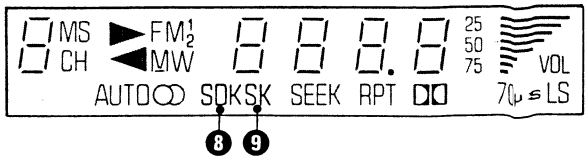
❻ ∞ : FM Stereo Reception Display

When FM stereo is being received, ∞ is illuminated.

❼ AUTO : Auto Display

Pressing the auto/mono switching button illuminates AUTO on the display. When pressed one more, it will go out.

• Reading the Display (FX-K5SDK)



❽ SDK: SDK Display

❾ SK: SK Display

• Tuning an FM/MW/LW station

1. Press tuner power switch ❽ to turn power on. Band and frequency will illuminate on the display ❸.
2. Press band selection button ❷ to set the band you wish to listen to.
3. Select the station you want to listen to by using either manual or seek tuning. Press preset button ❶ to place in memory the frequency of a station you often listen to.
4. Set volume ⓬, balance ⓮, bass ⓯ and treble ⓱ controls to the position you like best.
5. Press tuner power switch ❽ to turn the power off.

Manual Tuning

To manually tune a station, press the tuning button ⓫ on the (+) side (low to high frequency) or (−) side (high to low frequency).
Press the button once and the frequency will change 25kHz under FM, 9kHz under MW, and 1kHz under LW. Holding the button down longer than 0.5 seconds enables high speed frequency change.
Note:
Frequencies in the range of 281∼153kHz can be tuned in the downward direction in the LW band, but in the upward direction the range becomes 155∼281kHz.

Seek Tuning

To use seek tuning to find the next higher broadcast frequency from the present frequency, press the (+) side of the seek button ⓫.
To find the next lower frequency, press the (−) side. (Note: SEEK will illuminate on the display when this function is in operation.)
Note:
Seek tuning changes frequencies in the FM band in 50kHz steps, and those in the LW band in 9kHz steps.

Example: Seek tuning upwards from 158kHz
158kHz → 167kHz → 176kHz... 266kHz → 275kHz

Example: Seek tuning upwards from 266kHz
266kHz → 275kHz → 155kHz → 164kHz... 281kHz

• Station Tuning Memory

Press the preset button to place a frequency in memory. This is convenient for finding a station you listen to often. Afterwards, the station can be recalled with a simple one-touch operation by pressing the preset button. Follow the steps below to use the preset station memory.

1. Press band selection button ❷ to set the band of FM1, FM2, MW or LW.
2. Receive the station that you wish to memorize using either manual or seek tuning.
3. Press memory button ❺ and CH will flash on the display ❸ for 5 seconds. During this time, press the preset button ❶ once. (for example, press button 2 and $\overline{2}_{CH}$ will illuminate on the display.)
4. Now one button and one station frequency are in memory. Follow steps (2) and (3) for the other 5 buttons.

Note:
Both FM1 and FM2 cover the frequency band for 87.5 to 108MHz. One preset button sets FM broadcast for two stations in memory, so a total of 12 stations can be set.

3. PARTS LOCATION (FX-K5/EW, FX-K5SDK/WG)

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *The photo shows the model FX-K5/EW.*

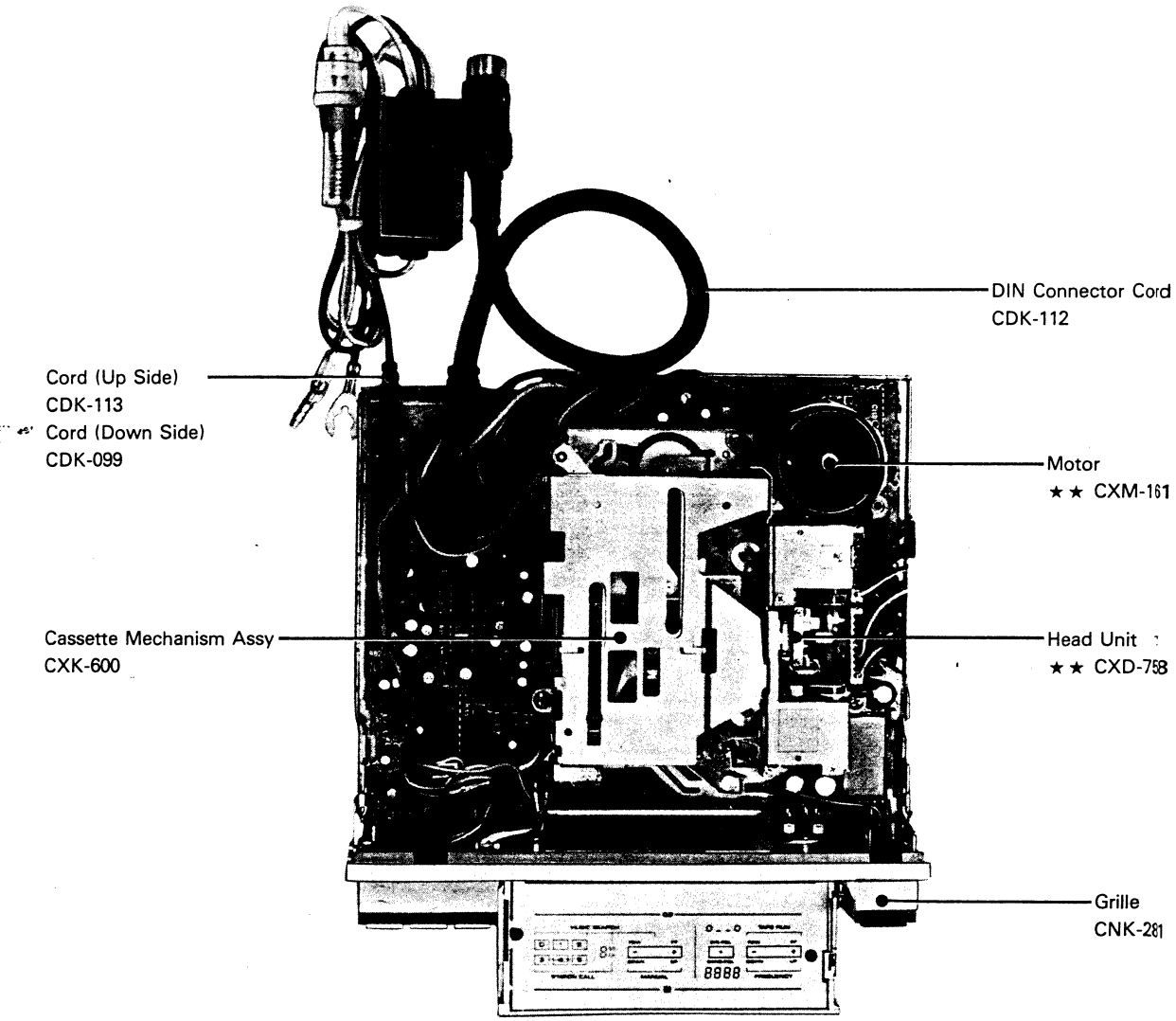


Fig. 1

4. PARTS LOCATION (FX-K5B/EW)

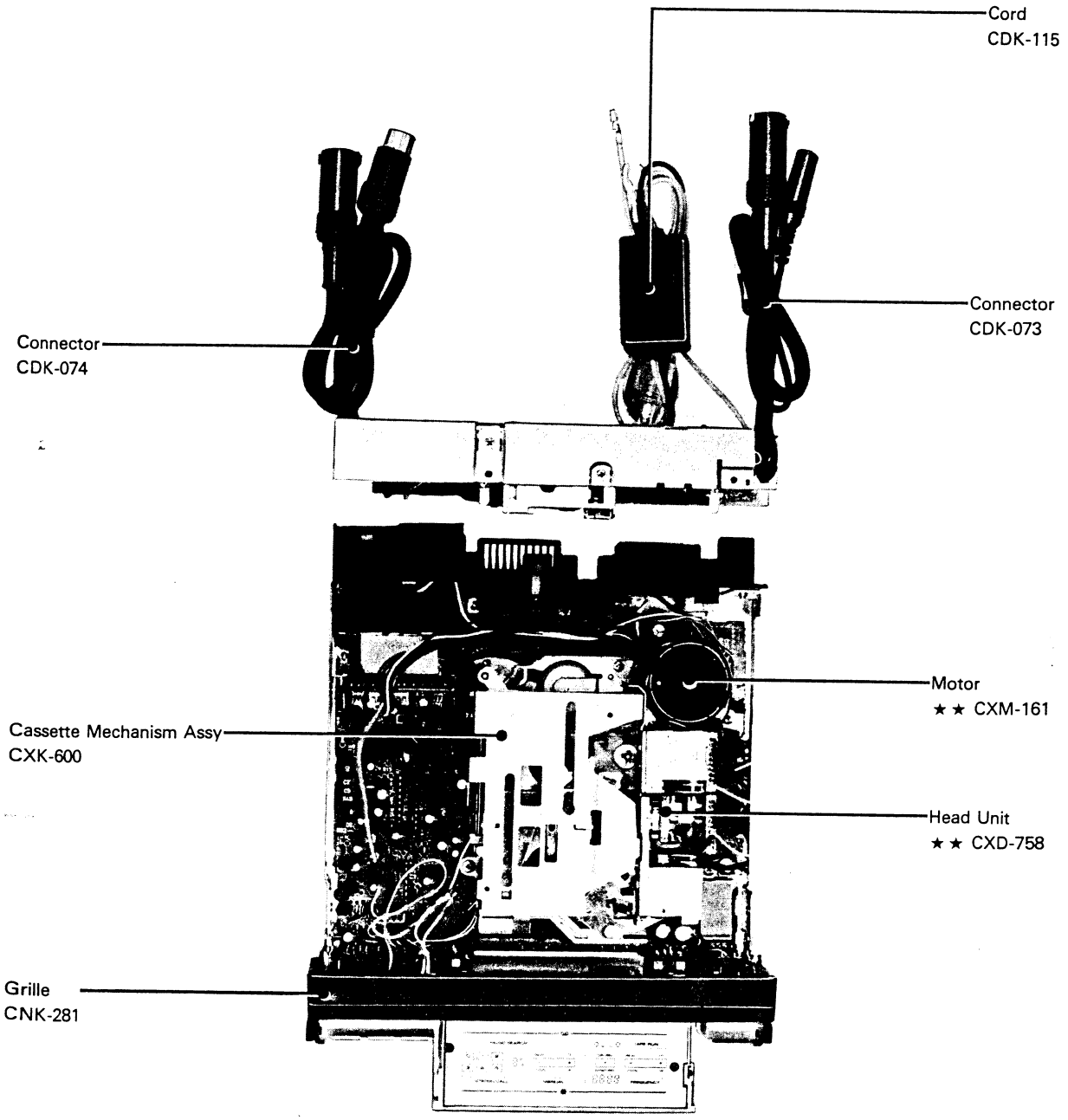


Fig. 2

5. DISASSEMBLY

• Case removal (FX-K5/EW, FX-K5SDK/WG)

1. The case can be removed by removing the four screws labeled "A".

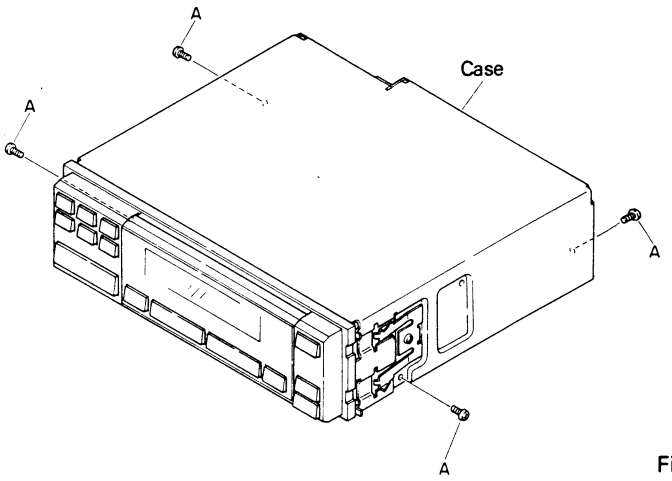


Fig. 3

• Case removal (FX-K5B/EW)

1. The case can be removed by first removing the battery cover and then the six screws.

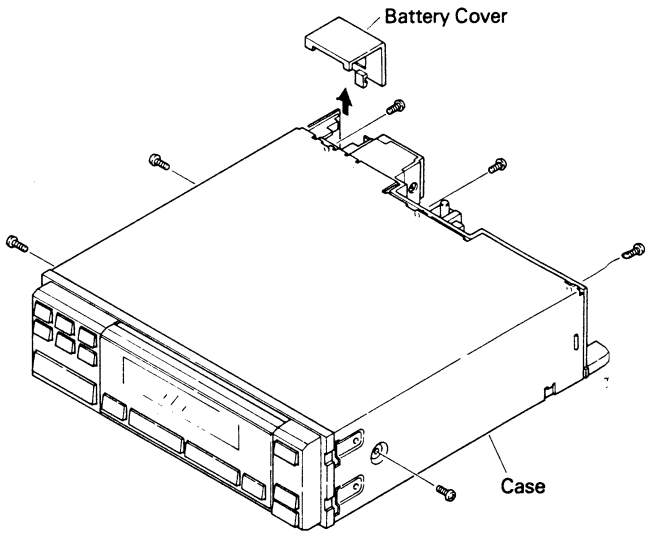


Fig. 4

• Cassette mechanism assembly removal

1. This assembly can be removed by removing the four screws labeled "B" and the connector.

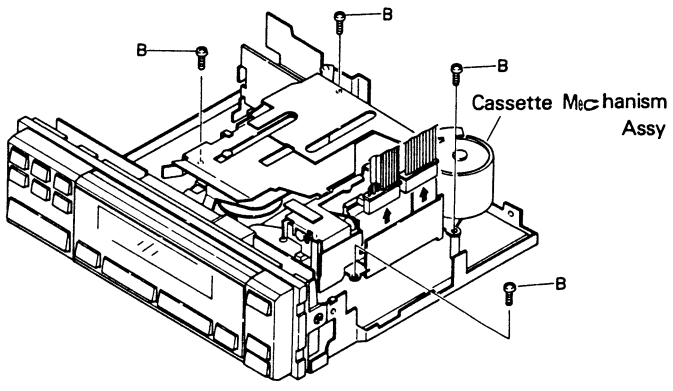


Fig. 5

• Chassis unit removal (FX-K5/EW, FX-K5SDK/WG)

1. This unit can be removed by removing the four screws labeled "C".

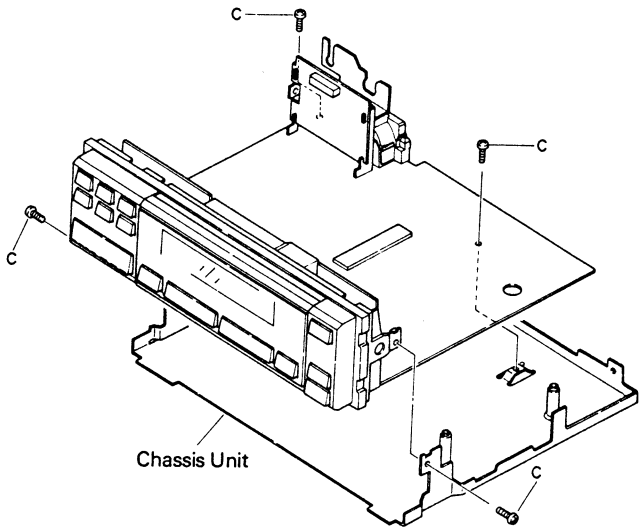


Fig. 6

• Chassis unit removal (FX-K5B/EW)

1. Remove the three screws labeled "H" and remove the rear panel assembly.
2. The chassis unit can then be removed by remvoing the four screws labeled "J".

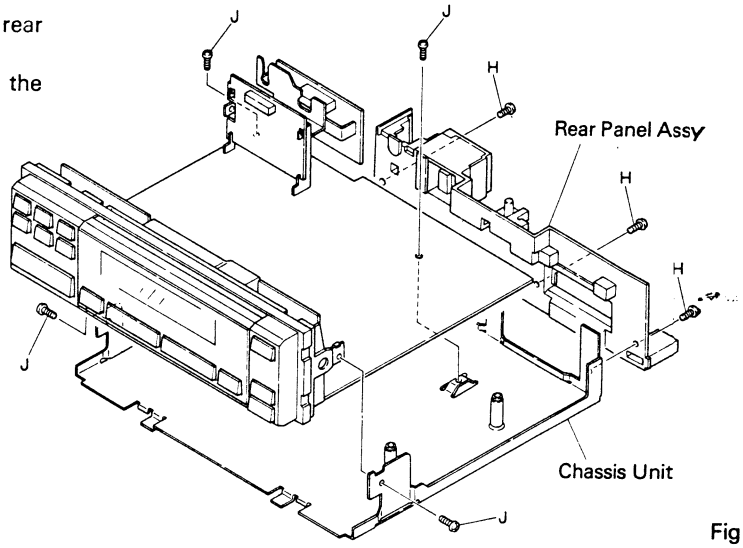


Fig. 7

• Grille assembly removal

1. This assembly can be removed by unsoldering points "A", "B", and "C" and then removing the two screws labeled "D".

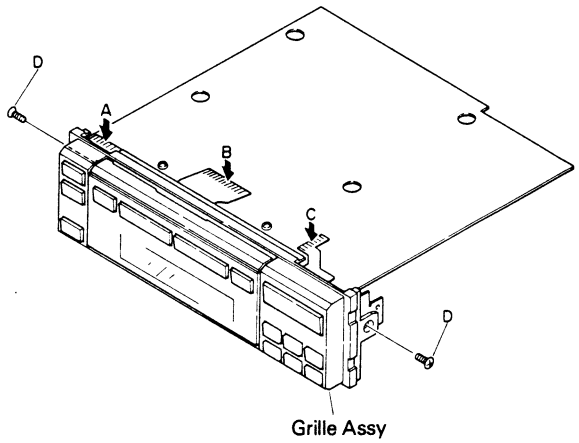


Fig. 8

• Switch unit (B) removal

1. This unit can be removed by removing the screw labeled "F".

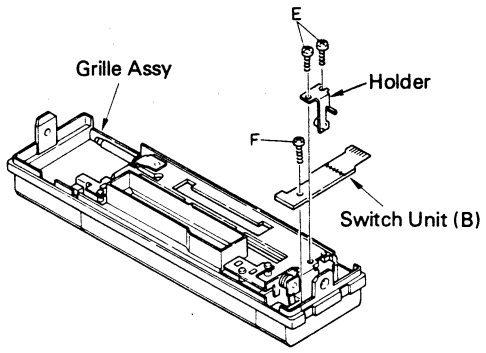


Fig. 9

• Display unit removal

1. Remove the two screws labeled "E" and take off the holder. The holder supports the display unit and allows it to turn, so it should be slid to the side and removed. (Fig. 9)
2. The display unit can be removed as shown in Fig. 10.

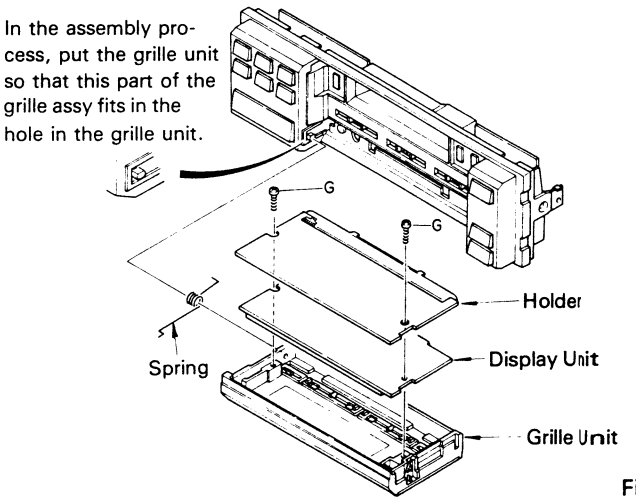

In the assembly process, put the grille unit so that this part of the grille assy fits in the hole in the grille unit.
G
G
Holder
Spring
Display Unit
Grille Unit

Fig. 10

6. CIRCUIT DESCRIPTION

• Level Diagram

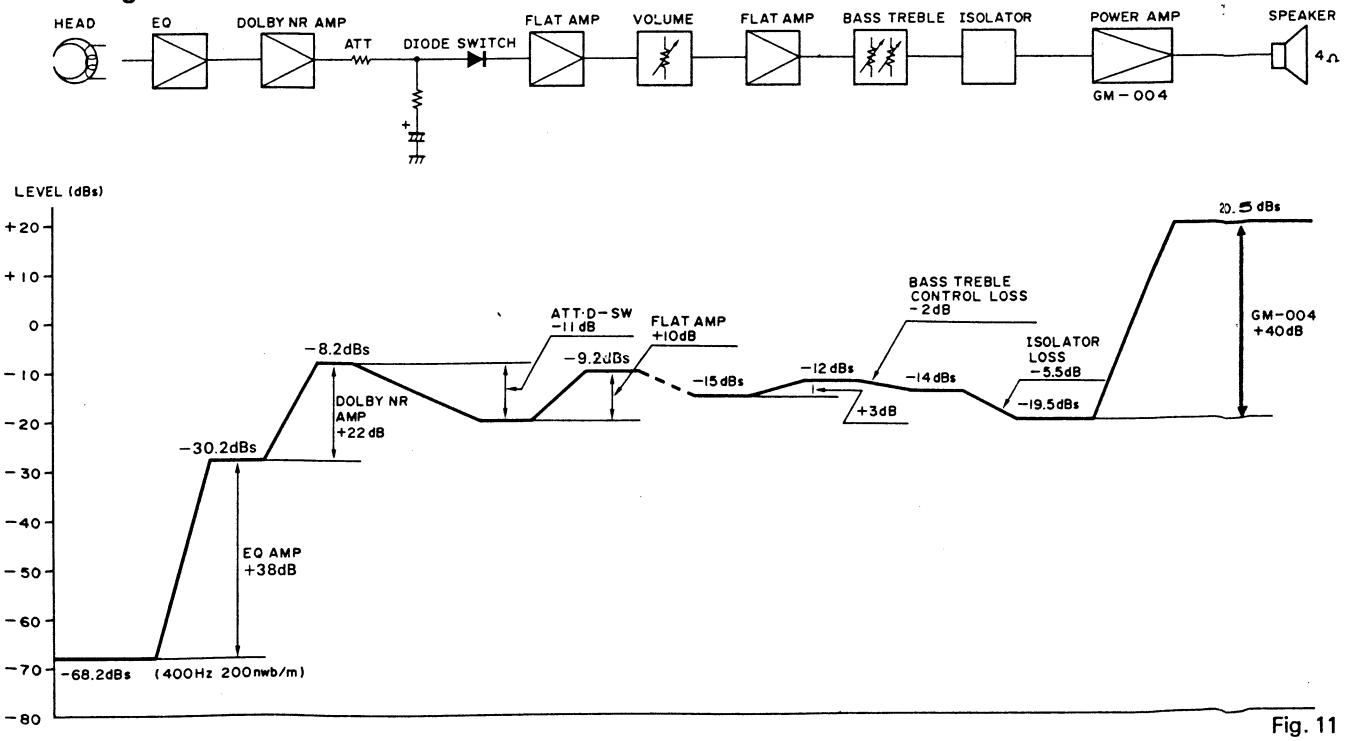


Fig. 11

• +B Diagram (FX-K5B/EW)

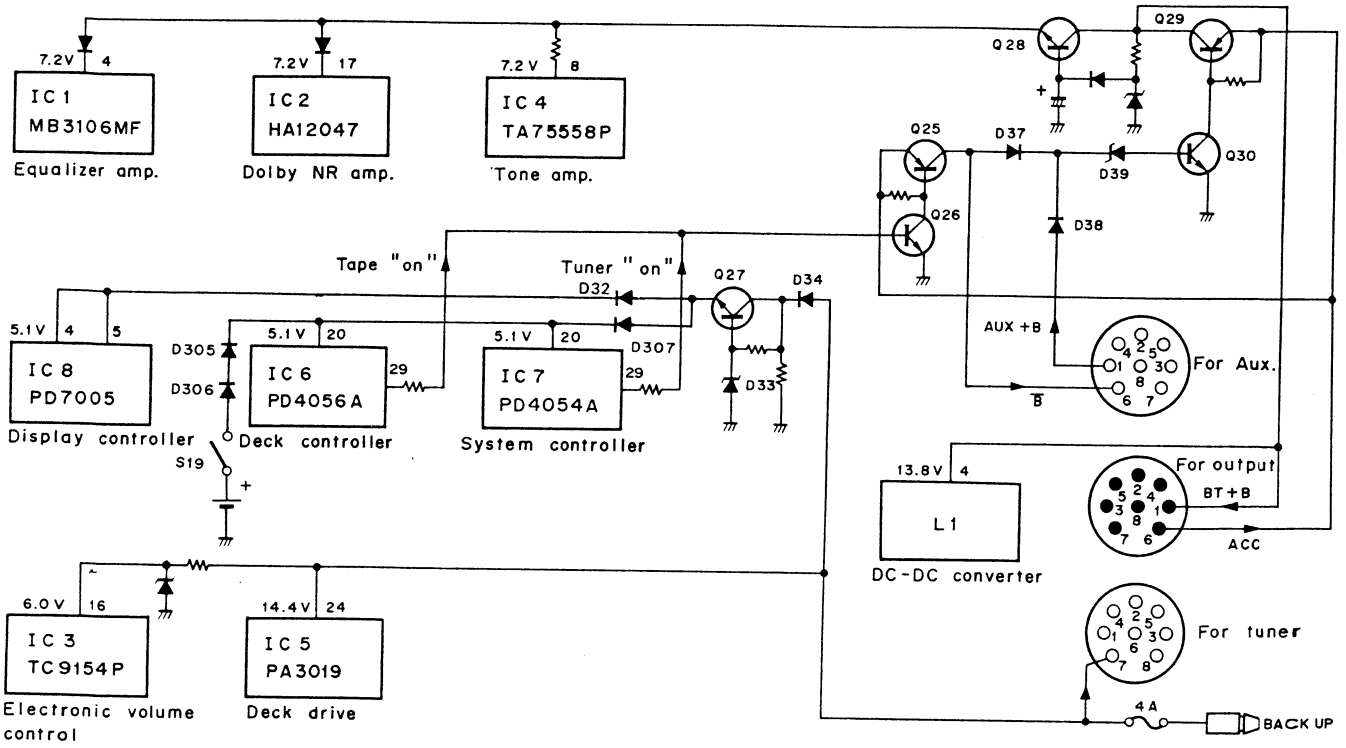


Fig. 12-1

• +B Diagram (FX-K5/EW, FX-K5SDK/WG)

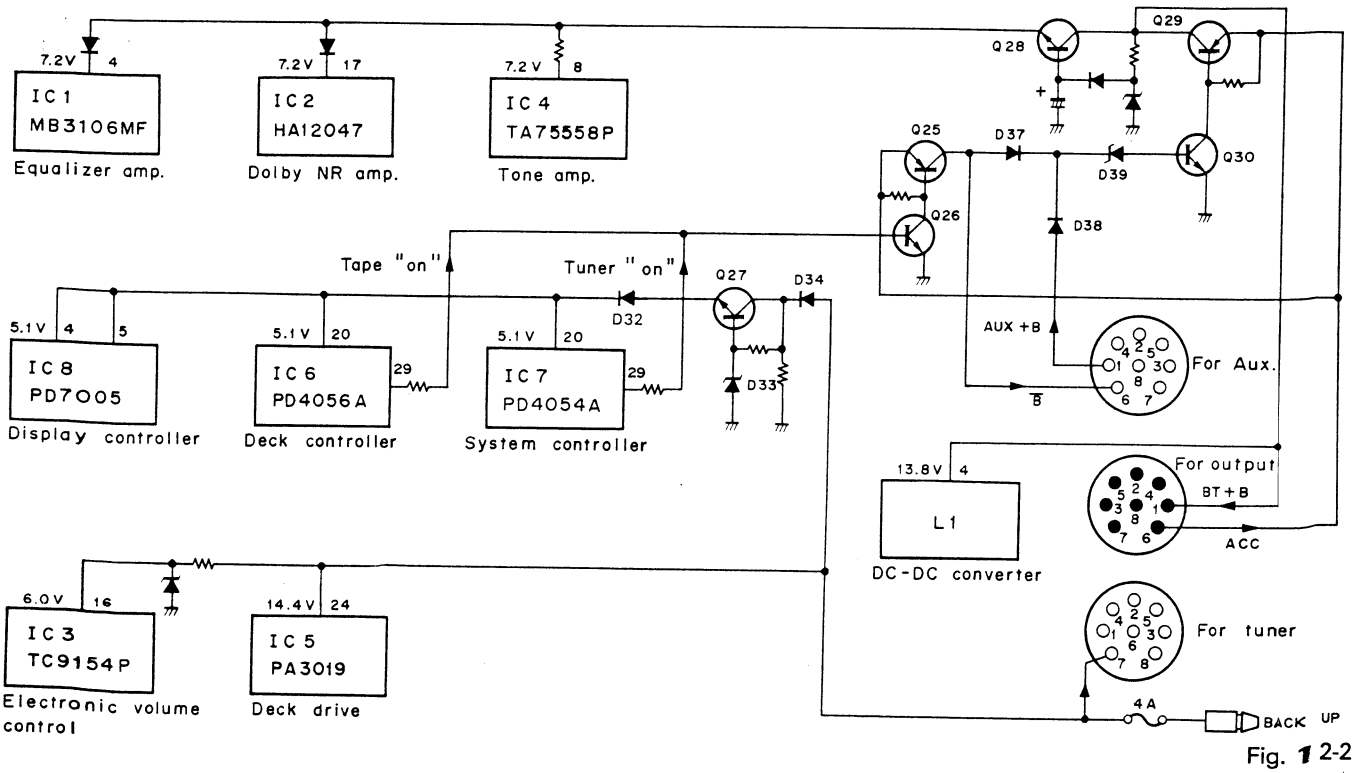


Fig. 12-2

• Block Diagram

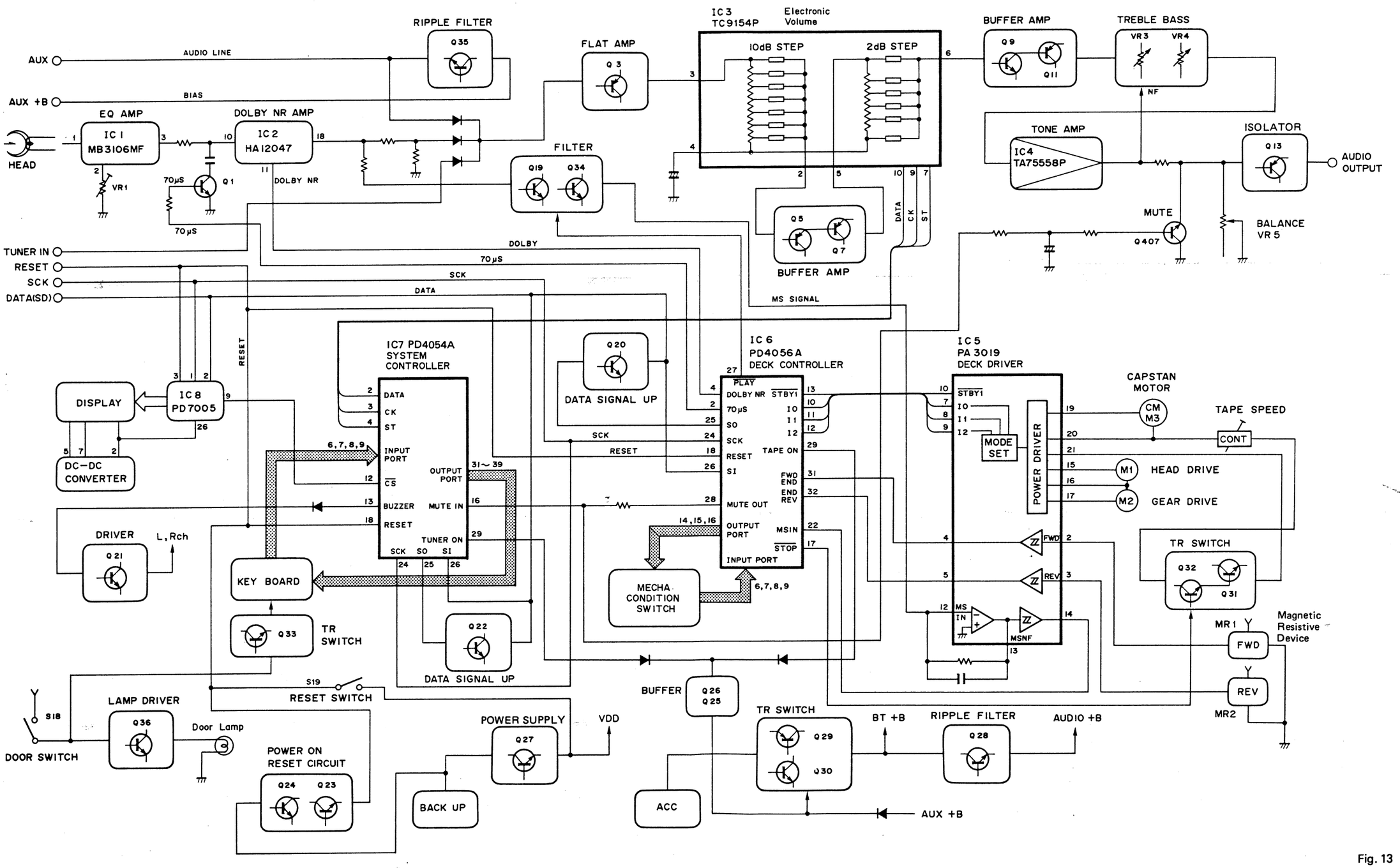


Fig. 13

• System Outline

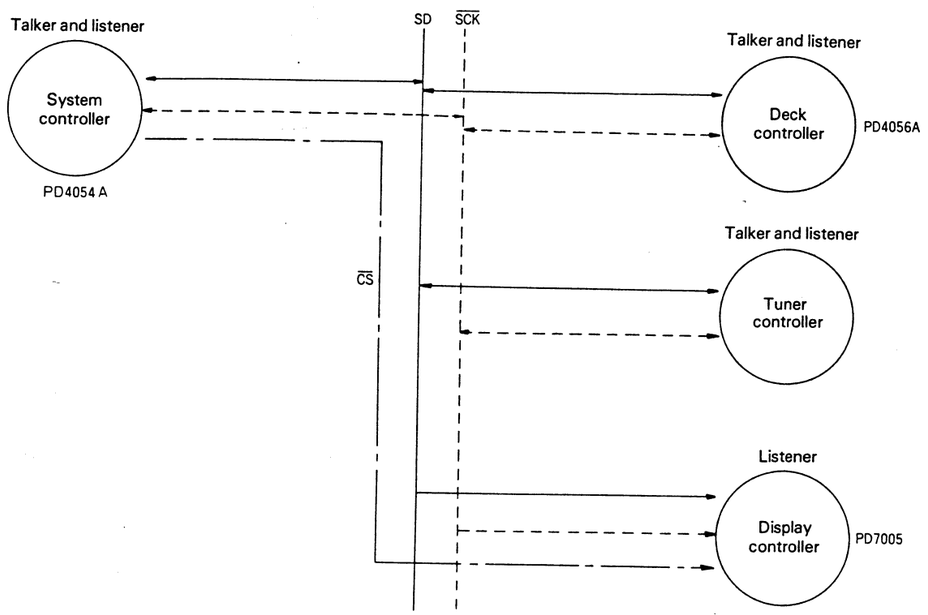


Fig. 14

In this unit, a system controller (PD 4054A), a deck controller (PD 4056A), and a tuner controller are linked via eight bit serial data transmission. There are three signal lines. These are: a data line (SD), a serial clock line (SCK), and a CS line between the system controller and the display controller.
The system, deck, and tuner controllers switch automatically between talker and listener in the sequence shown in Figure 15. The display controller is "listener only", and obtains 80 bits of serial data from the CS signal from the system controller.

Data is transmitted among the controllers by switching between talker and listener in the order shown in Figure 15 (system to deck to tuner to system). If two seconds pass after the command controller transmits a command, without a command being transmitted by either the deck or tuner controller, the system controller will transmit a "reset" command, followed by a "standby" command. The tuner and deck will then be switched "off."
When the deck and tuner controllers receive the "reset" command from the system controllers, they will enter the "listener" regardless of the above timing. They will receive the "standby" command from the system controller in this state.

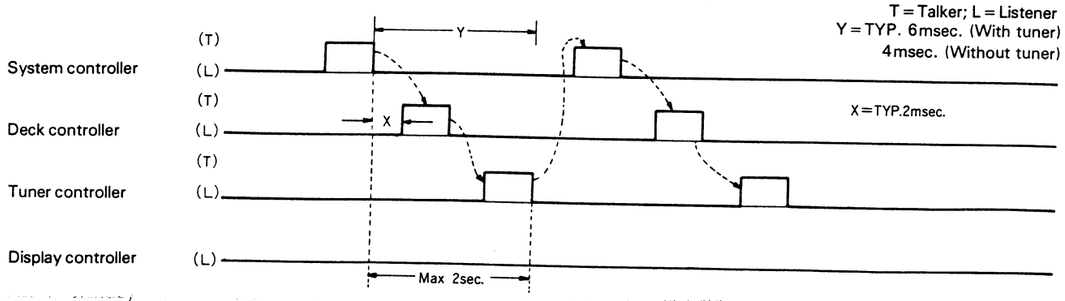


Fig. 15 Sequence of Switching between Talker and listener

When the tuner is not linked directly with the system, the system controller switches to "talker" after receiving data from the deck controller.
Display data may be transmitted from the system controller to the display controller indepedently. In such case, the system controller first transmits a display command in the "talker" mode. It then transmits a CS signal and 80 bits of display data to the display controller. The deck controller does not enter the "talker" mode immediately after receiving the display command. It enters the "talker" mode after 80 bits of display data have been transmitted. The tuner controller then enters the "command receipt from deck controller" mode.

When either the deck or tuner controller causes a change in the display, the controller causing the change transmits a command in the "talker" mode. It then transmits 80 bits of display data. The other controller, which is in the "listening" mode, ignores this transmission. The system controller inputs this transmission of display data. It then adds volume data, etc., as necessary, and switching temporarily to "talker", outputs 80 bits of display data to the display controller.

*The serial clocks operate at 100 kHz. When in the "talker" mode, the controller uses its own internal clock. When in the "listener" mode,, the controller uses the talker's clock.

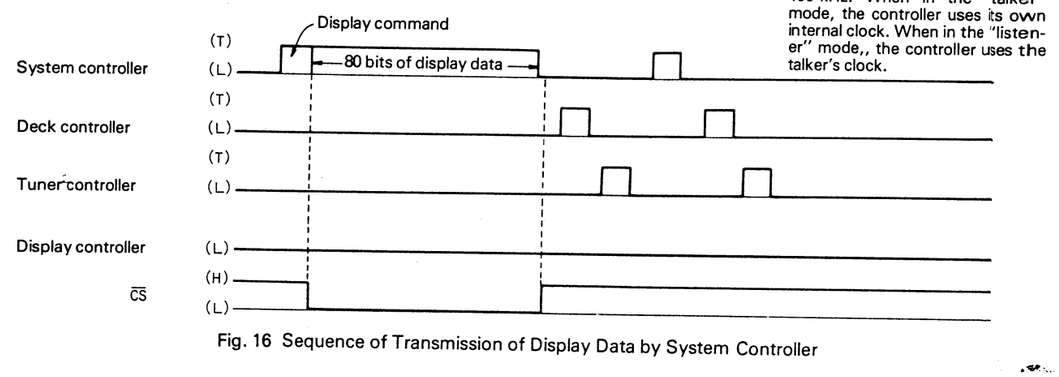


Fig. 16 Sequence of Transmission of Display Data by System Controller

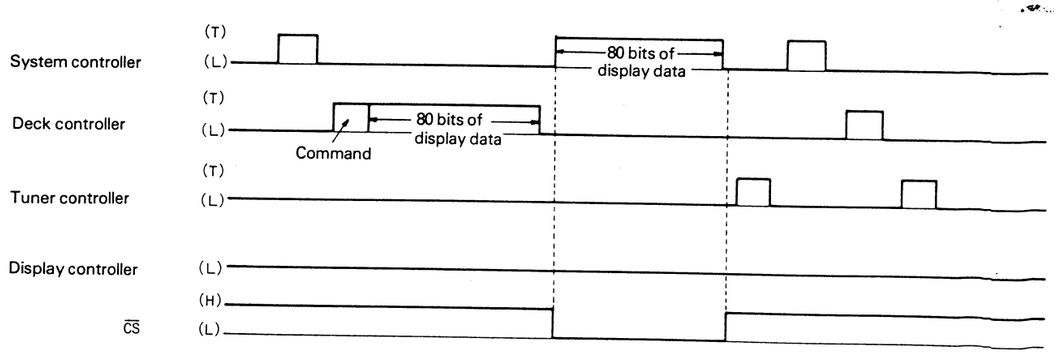


Fig.17 Sequence of Transmission of Display Data from Deck Controller

• Standby Function

The system controller checks the position of the automobile Acc switch at least once every 6 microseconds (pin 50). If the system controller detects that the Acc switch is in the "off" position, it sends a display command after it switches to the "talker" mode. It then transmits an 80-bit "all 0" display data to the display controller, thus turning off the display. When it next switches to the "talker" mode, it transmits a "standby" command to the deck and tuner controllers, switching the deck and tuner off.

When in the "standby" (Acc off) mode, the deck and tuner controllers' CPUs are shut down, but data in RAM is preserved. The system controller, however, continues to check the position of the Acc switch and to run the clock.
If the system controller detects the Acc switch to be in the "on" position for two seconds, it transmits a display command to the serial interface and transmits the display data which was stored before the Acc switch was moved to the "off" position. This data releases the deck and tuner controllers from the standby mode. If the unit was in the "deck" mode or "tuner" mode prior to the Acc switch having been moved to the "off" position, the unit is now returned to that mode.

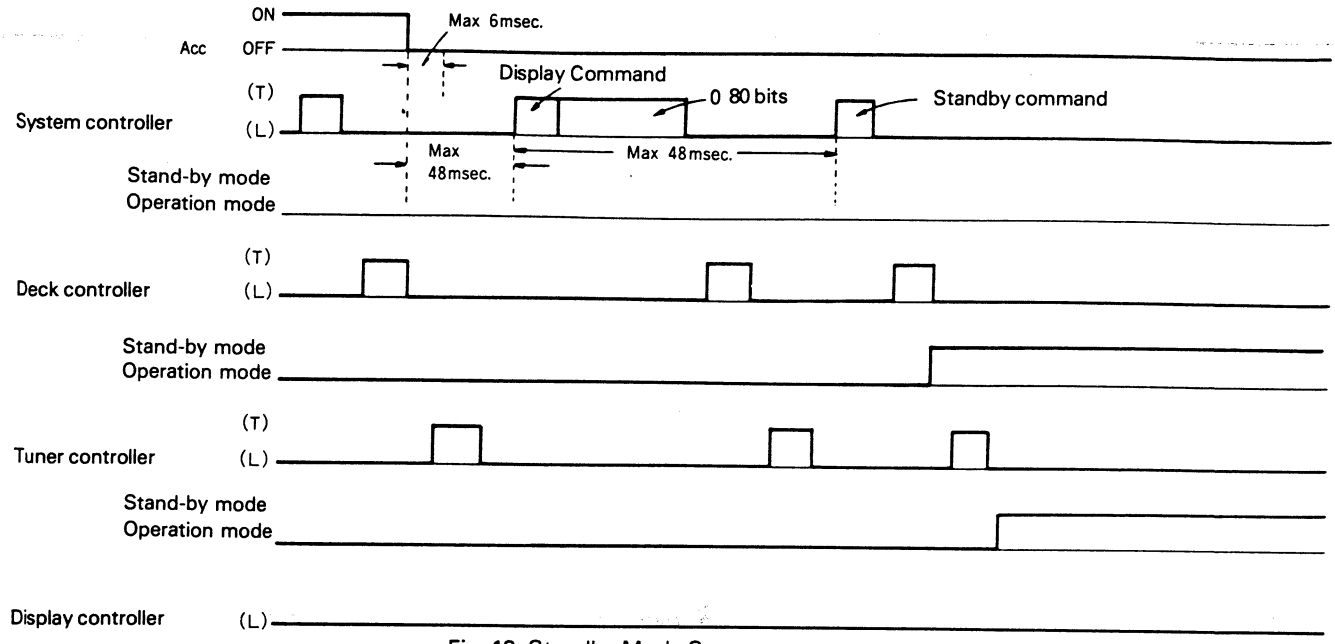


Fig. 18 Standby Mode Sequence

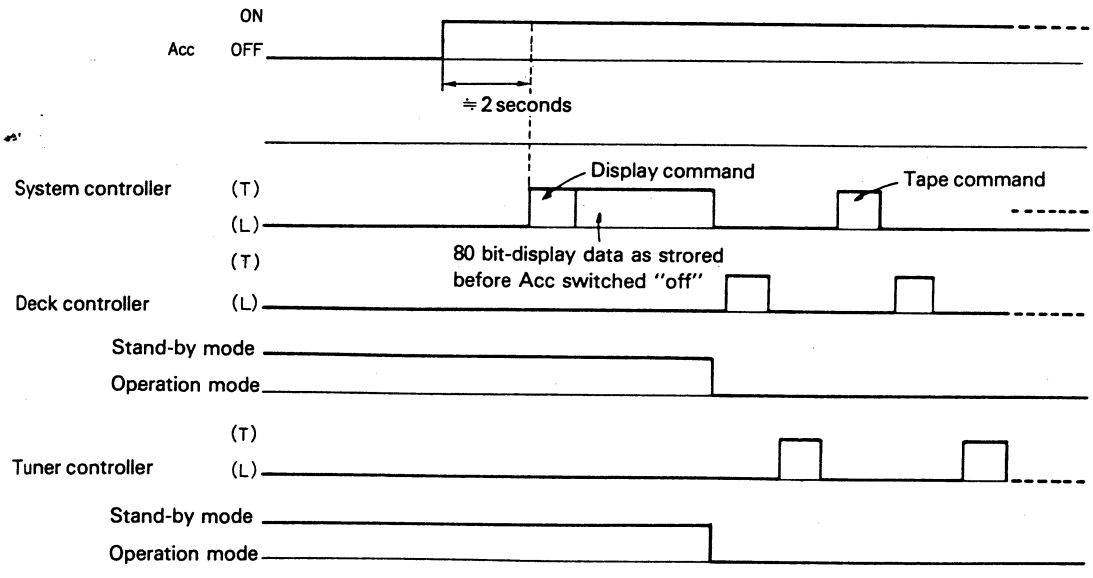


Fig. 19 Standby Release Sequence (When Unit Was in "Deck" Mode before Acc Switched "Off")

• Switching Between Tape and Tuner

1. Tape to Tuner (Figure 20)

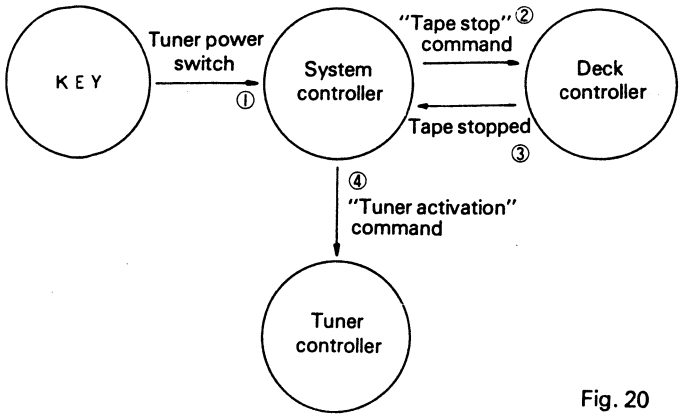


Fig. 20

If the "tuner power" switch is pressed while a tape is running, the system controller will send a "tape stop" command to the deck controller. When the system controller receives the "tape stopped" message from the deck controller, it will send a "tuner activation" command to the tuner controller, and the unit switches from the "tape" mode to the "tuner" mode.

2. **Tuner to Tape**

a. **Tape Power Switch Pressed**

If the "tape power" switch is pressed while the tuner is operating, the system controller will send a "stop tuner" to the tuner controller. When the system controller receives the "tuner stopped" signal from the tuner controller, it will send a "tape activation" command to the deck controller, and the unit switches from the "tuner" mode to the "tape" mode.

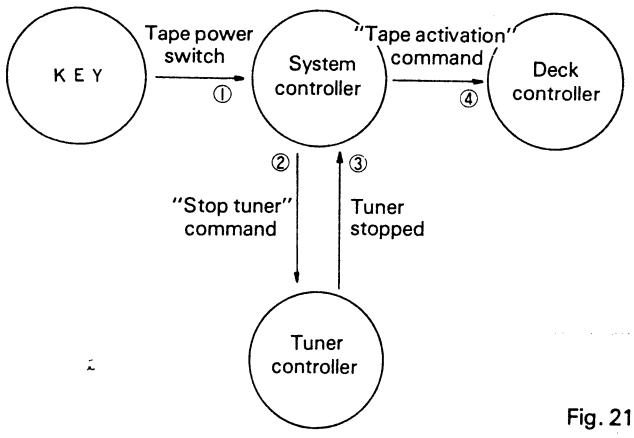


Fig. 21

b. **Cassette Inserted**

If a cassette is loaded while the tuner is operating, the deck controller will send a "tape activation" request message to the system controller. When the system controller receives this message, it will send a "stop tuner" command to the tuner controller. When the system controller receives the "tuner stopped" signal from the tuner controller, it will send a "tape activation" command to te deck controller. In this way, the unit automatically switches from the "tuner" mode to the "tape" mode when a cassette is loaded.

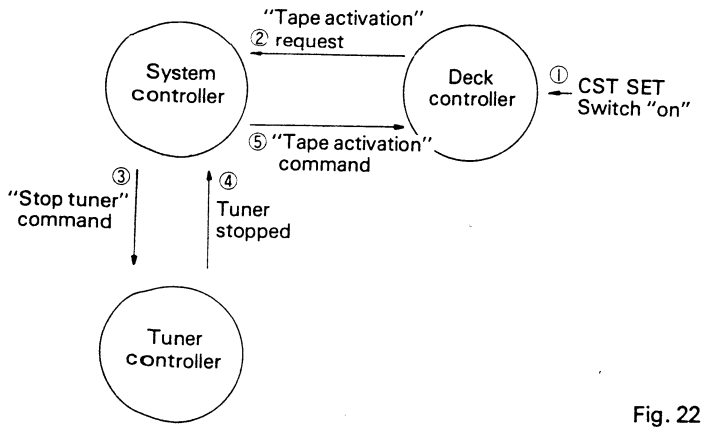


Fig. 22

• Drive system outline

The deck in this unit uses a motor drive, rather than the traditional solenoid. The drive system is composed of three motors: one providing power for the running and loading modes; one to drive the head base; and one to drive the "FF/REW" switching gear. Position sensing switches are arranged to correspond to each of the positions of the head base (FWD PLAY, REV PLAY, FF/REW & EJECT, and MS (music search)). Sensing switches are also arranged to correspond to each of the positions of the "FF/REW" switching gear (L (left), R (right), and CENTER)). Finally, two sensing switches are arranged to correspond to the LOADING and EJECT positions. Each of these positions is controlled by the "deck controller" (IC 6). Multipolar magnets are attached to each of the two reel spindles, and magnetic resistive device (MR 1, MR 2) are positioned to receive signals from these magnets indicating rotation.

The "deck driver" (IC 5) receives motor control signals from the deck controller and sends signals to drive each of the motors. The rotation of the reel unit is converted into an electrical signal, which is then "wave-form shaped" and converted into pulses and fed to the deck controller. When a music signal above a certain level is received from the audio section, a signal is sent to the deck controller in the form of a pulse (MS (music search)). In response to input from the keyboard or the tape insertion sensing switch, the deck controller sends a control signal for the appropriate motor to the deck driver. When a signal is received from a sensing switch that the deck has been set in a particular mode, a motor control signal is sent to the deck driver to turn the motor off. A reel pulse signal is used to detect the end of a tape, and to compensate reel unit over-run while in the MS mode.

• Electronic Volume Control

- Electronic volume control (IC 3) is carried out by serial transmission of data from the system controller (IC 7), allowing volume to be adjusted in 2 dB increments. The control signals from IC 7 pin 2 (DATA), pin 3 (CK) and pin 4 (ST) are as follows:

1. The data line transmits data concerning degree of damping and channel selection. This data is made up of 18 bits. (Fig. 23)
2. The CK line is for the clock signal.
3. A strobe signal latches volume data by causing the ST Line to go "H."

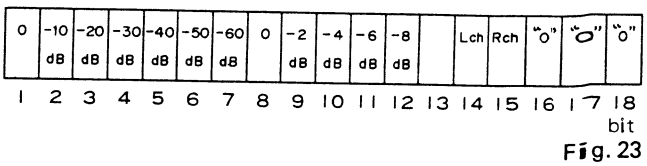


Fig. 23

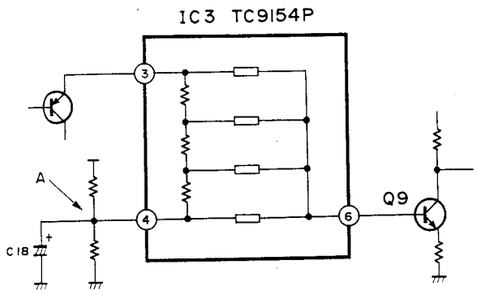
• Electronic Muting

The mute function electronically reduces volume. Consequently, in the MS mode, the audio signal does not go further than the volume control.

The mute circuit (Q407, Q408) in the stage part of the treble and bass circuits serves to prevent noise from developing between the latter part of the electronic volume and the bass and treble circuits.

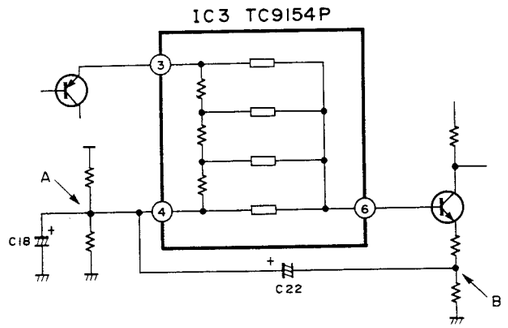
• Electronic Volume Buffer Amplifier

The buffer amplifiers (Q9, Q10) which are connected to the end of the electronic volume control (pin 6, pin 11) increase the degree of muting by changing from the general circuit shown in Figure 24 to the circuit shown in Figure 25.



If the impedence of C18 is not reduced sufficiently, a signal will leak through even with volume reduced.

Fig. 24



The a.c. potential at points A and B is equalized by C22, thus increasing the degree of muting.

Fig. 25

• Reel Unit Rotation Pulse Detection Circuit

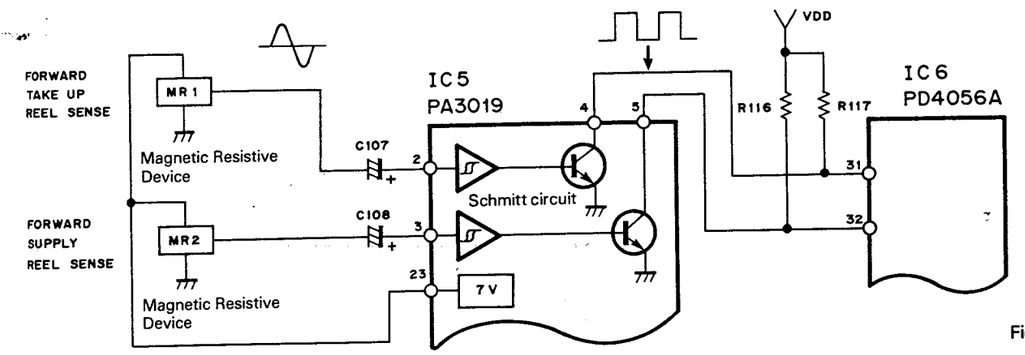


Fig. 26

- A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC 5, and a square wave is output from pins 4 and 5 (IC 5) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When the reel stops, "direction change" occurs.
2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 560 ms), the deck switches to the play mode.
3. **Reel motor racing detector:** As in the case of tape end detection, the take-up reel unit is monitored (forward take-up reel unit when in forward play, reverse take-up reel unit when in reverse play). When the number of revolutions per unit of time exceeds the determined level, the motor is stopped.
4. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

• MS Circuit

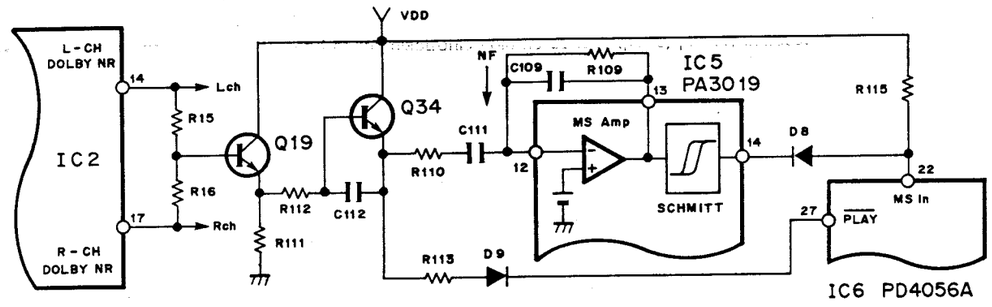


Fig. 27

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC 5), and a Schmitt comparator (inside IC 5). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC 5 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC 6, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. **"Play" Music Selection (Equivalent circuit diagram 28):** IC 6 pin 27 goes "Low", and Q34 and D9 go to the "on" position. Since Q34 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R110. The gain from either the left channel or the right channel to IC 5 pin 13 is approximately 45 dB. The low range cut off frequency is approximately 300 Hz and the high range cut off frequency is approximately 7 kHz.

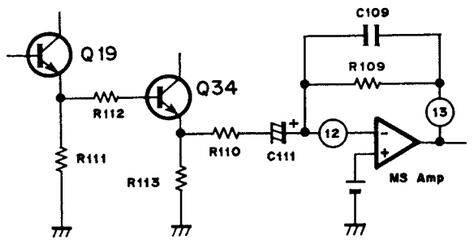


Fig. 28 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

2. **"FF" "REW" Music Selection (Equivalent circuit diagram 29):** IC 6 pin 27 goes "high", and Q34 and D9 go to "off." At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off is approximately 7 kHz.

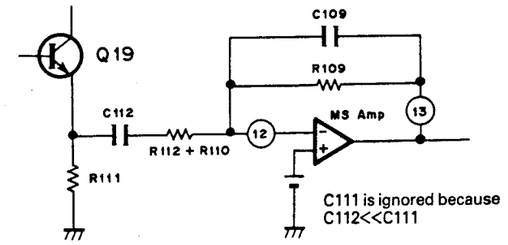


Fig. 29 Equivalent Circuit During the MS Mode

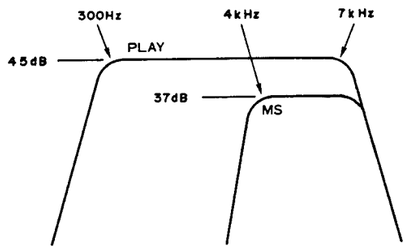


Fig. 30 Filter Characteristics

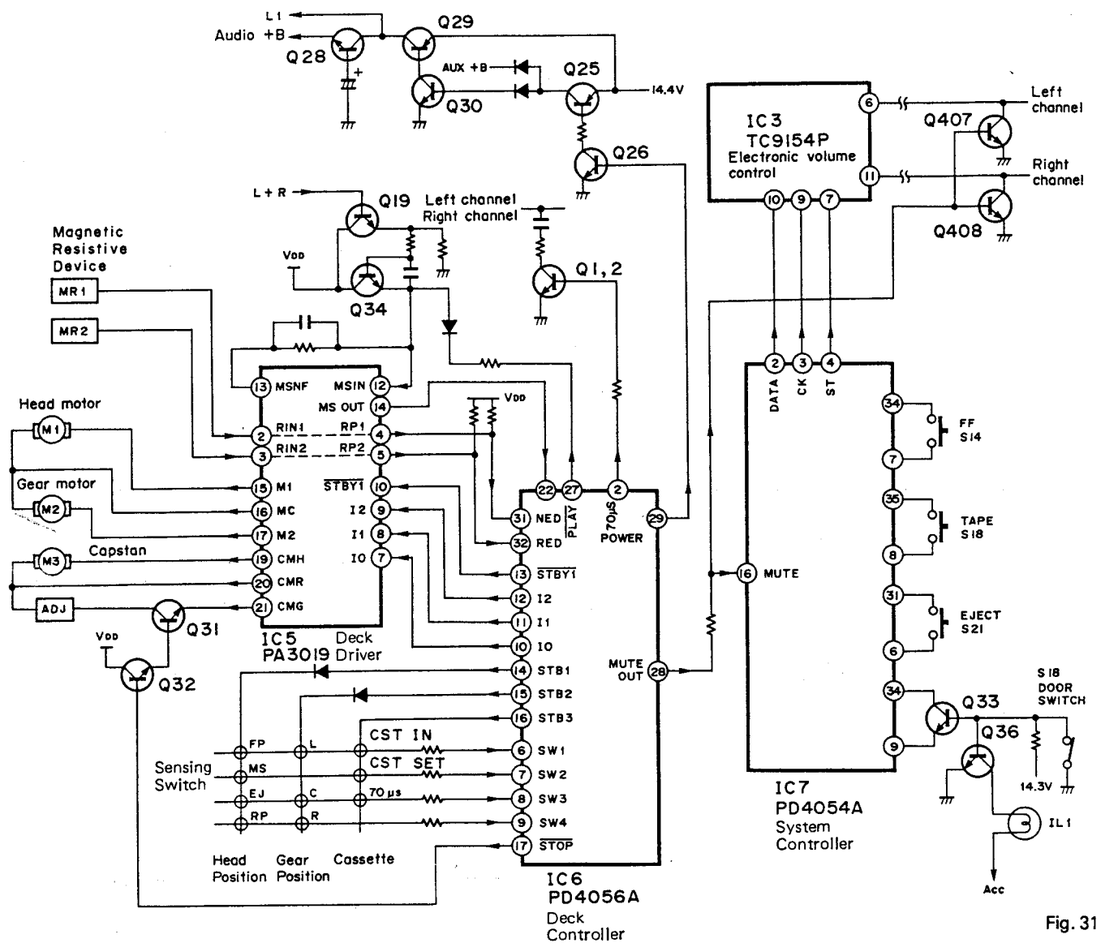


Fig. 31

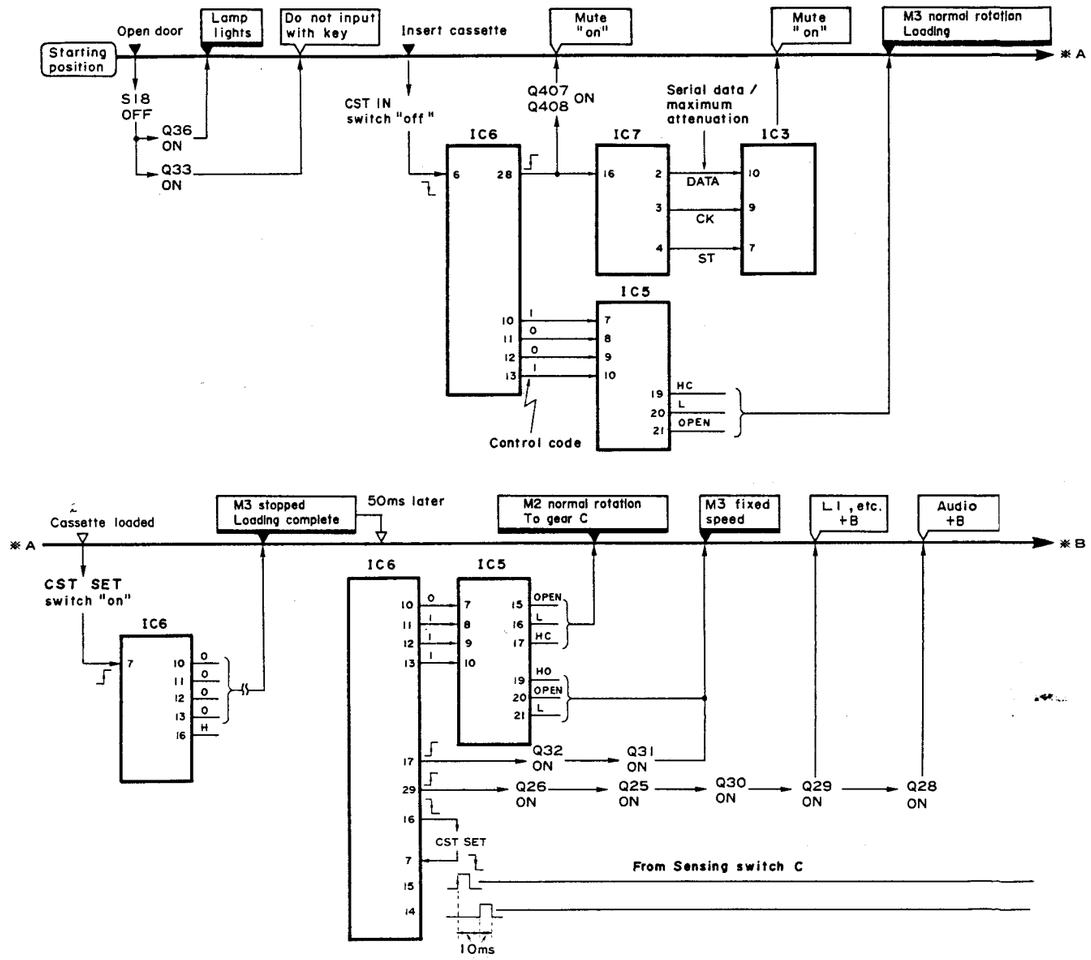
• Protection Circuits

Protection circuits operate in the following manner if one of the six problems described occurs:

1. If the tape should break while in the play mode, tape action will be released when the reel unit racing is detected.
2. If ATSC operation should continue for 10 seconds without stopping, it will be discontinued and the tape stopped. Normal action will resume if the tape is then ejected and a new tape inserted.
3. If a tape end is detected three times in 16 seconds, the deck will be stopped in order to protect the mechanism. If the "TAPE" button is then pressed, action will resume.
4. Detection of error in data communication.
   This unit operates by continually transmitting data between four ICs (integrated circuits). If something should cause noise to develop in the communication lines, causing an error in the data being transmitted, the deck and tuner will be shut down for two seconds, then returned to the state that they were in before the error developed.
   Note, however, that if the deck or tuner were in the "scan", "frequency up", "frequency down", or "music search" mode immediately prior to the error in data transmission, it will not be returned to that mode. Rather, the deck will enter the "play" mode and the tuner will be tuned to the last station being played.
5. If, for some reason, either loading or unloading should take longer than five seconds, the deck will switch to the opposite mode (loading in the case of unloading, and unloading in the case of loading). If the cassette should somehow become stuck, and the deck switches between loading and unloading three times with neither ejection nor loading taking place, the deck will shut down.
6. If, while the mechanism is operating, the head and gear motors do not go to their prescribed positions in two seconds, they will be released.

• Explanation of operation (Refer to Fig. 31)

1. Cassette insertion → forward play (deck was last run in forward direction; or, after resetting)



• Control code

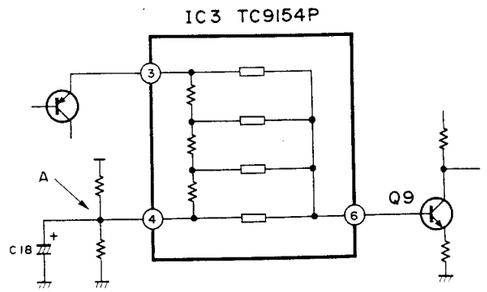
IC6 PD4056A / **IC5 PA3019**

Control mode		Control code 10	11	12	13	Mechanism action	Output pin voltage 19	20	21	15	16	17
Output "off"		0	0	0	0	Release	open	open	open	open	open	open
M3	Normal	1	0	0	1	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	0	1	Eject	L	HC	↑	↑	↑	↑
	Fixed speed	1	1	0	1	Normal operation	HO	open	L	↑	↑	↑
M1	Normal	0	0	1	1	Head in forward play direction	↑	↑	↑	HC	L	↑
	Reverse	1	0	1	1	Head in reverse play direction	↑	↑	↑	L	HC	↑
M2	Normal	0	1	1	1	Gear in left "L" direction	↑	↑	↑	Open	L	HC
	Reverse	1	1	1	1	Gear in right "R" direction	↑	↑	↑	↑	HC	L

HC.....app. 7V HO.....Vcc −1.7V Open.....high impedance L.....0V

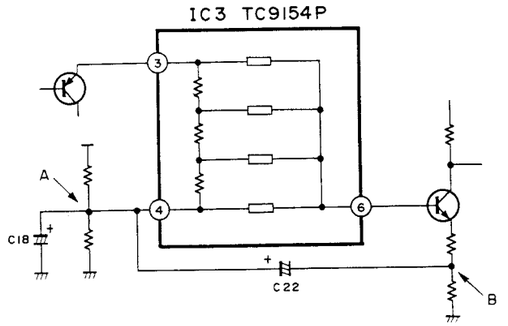
• Electronic Volume Buffer Amplifier

The buffer amplifiers (Q9, Q10) which are connected to the end of the electronic volume control (pin 6, pin 11) increase the degree of muting by changing from the general circuit shown in Figure 24 to the circuit shown in Figure 25.



If the impedence of C18 is not reduced sufficiently, a signal will leak through even with volume reduced.

Fig. 24



The a.c. potential at points A and B is equalized by C22, thus increasing the degree of muting.

Fig. 25

• Reel Unit Rotation Pulse Detection Circuit

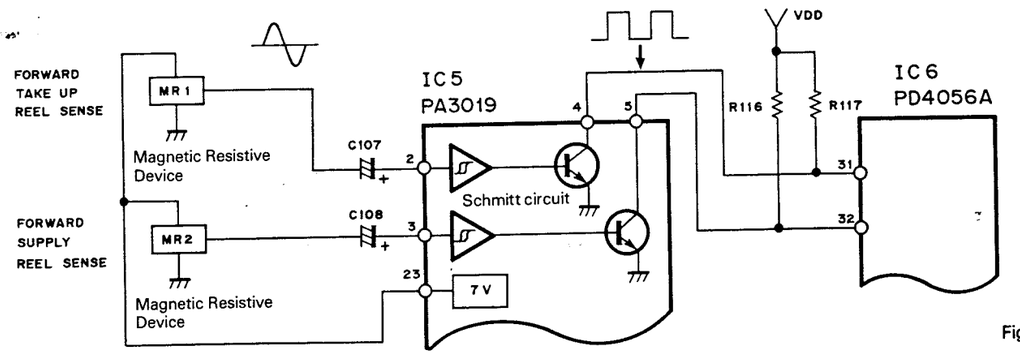


Fig. 26

- A continuous-wave is transmitted by the magnetic resistive device (MR 1, MR 2) as the reel unit rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC 5, and a square wave is output from pins 4 and 5 (IC 5) in synchronization with the rotation of the reel unit. When rotation stops, potential is fixed at 0 or 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When the reel stops, "direction change" occurs.
2. **ATSC:** While rewinding, when rotation of the reel unit on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 560 ms), the deck switches to the play mode.
3. **Reel motor racing detector:** As in the case of tape end detection, the take-up reel unit is monitored (forward take-up reel unit when in forward play, reverse take-up reel unit when in reverse play). When the number of revolutions per unit of time exceeds the determined level, the motor is stopped.
4. **MS overrun compensator:** When a blank spot on the tape is detected when RMS (rewind music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel unit. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (fast forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

• MS Circuit

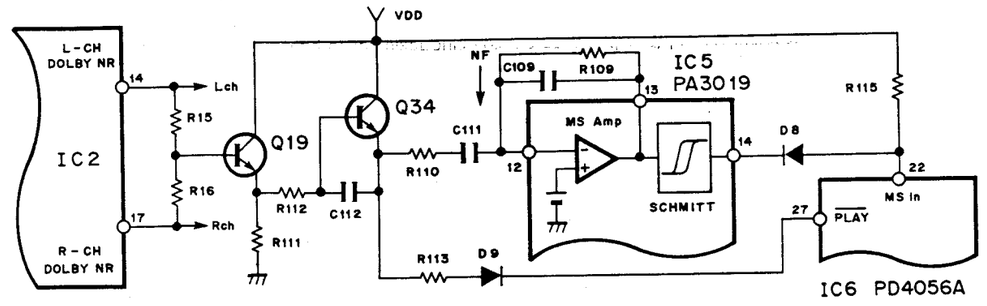


Fig. 27

The MS circuit detects blank spots on the tape. It consists of a filter, a differential MS amplifier (inside IC 5), and a Schmitt comparator (inside IC 5). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC 5 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC 6, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. **"Play" Music Selection (Equivalent circuit diagram 28):** IC 6 pin 27 goes "Low", and Q34 and D9 go to the "on" position. Since Q34 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R110. The gain from either the left channel or the right channel to IC 5 pin 13 is approximately 45 dB. The low range cut off frequency is approximately 300 Hz and the high range cut off frequency is approximately 7 kHz.

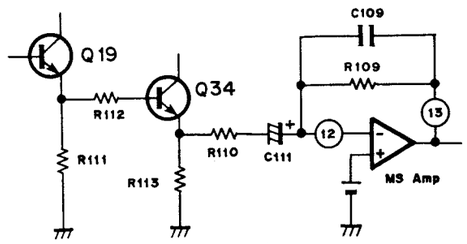


Fig. 28 Equivalent Circuit During "Play" Music Selection (Music Repeat, etc.)

2. **"FF" "REW" Music Selection (Equivalent circuit diagram 29):** IC 6 pin 27 goes "high", and Q34 and D9 go to "off." At this time, the gain is approximately 37 dB, the low range cut off frequency is approximately 4 kHz and the high range cut off is approximately 7 kHz.

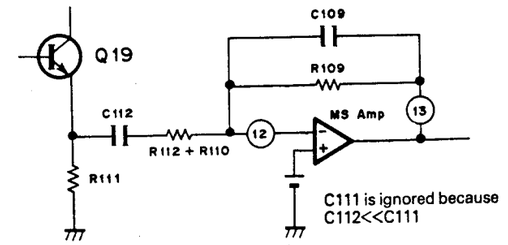


Fig. 29 Equivalent Circuit During the MS Mode

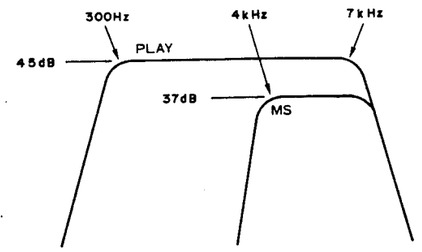


Fig. 30 Filter Characteristics

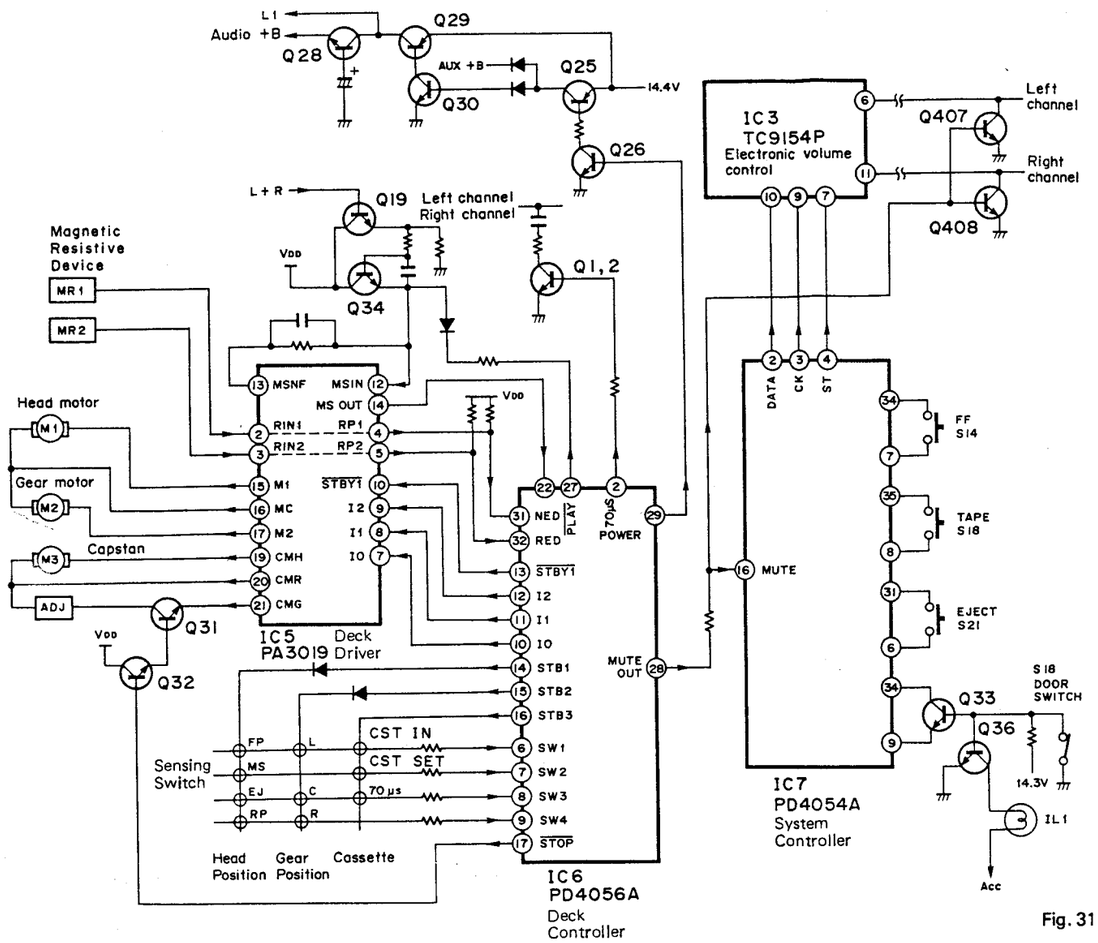


Fig. 31

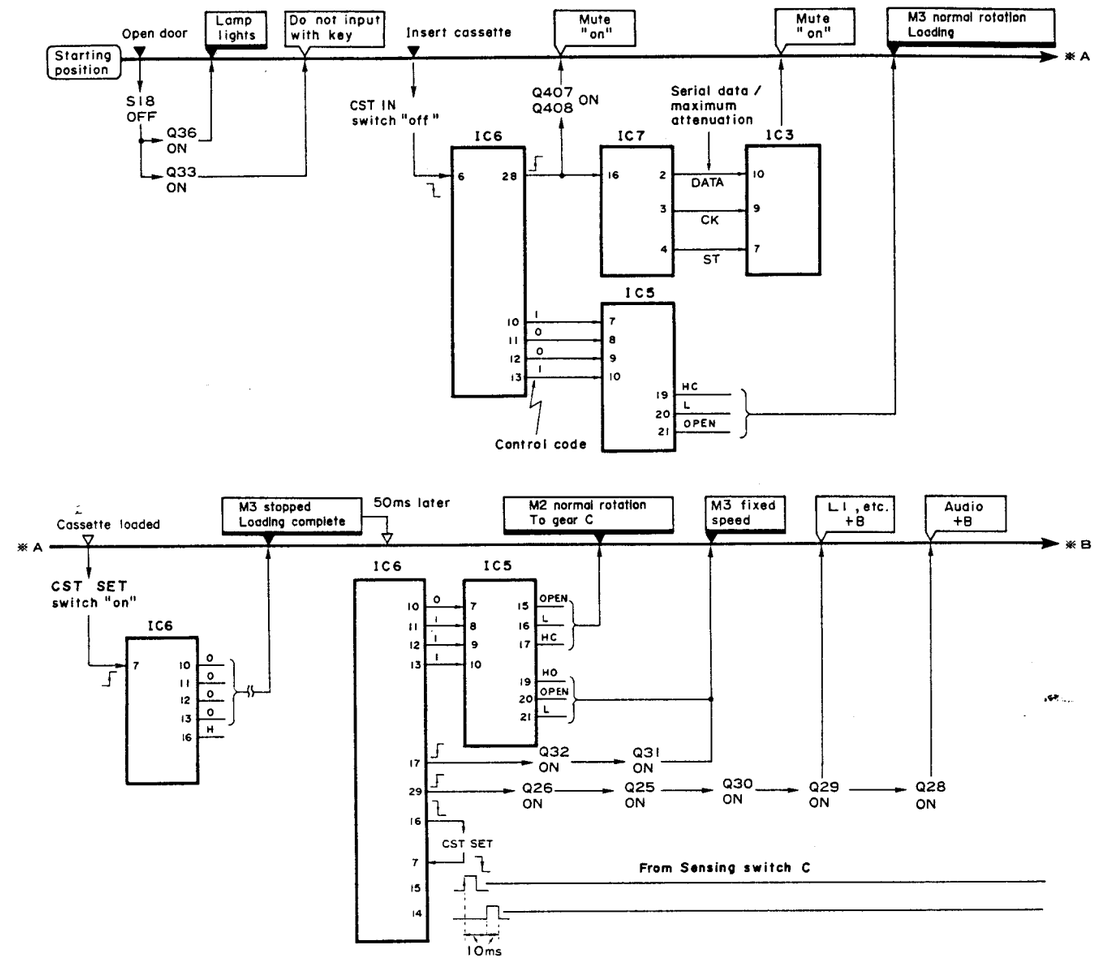
• Protection Circuits

Protection circuits operate in the following manner if one of the six problems described occurs:

1. If the tape should break while in the play mode, tape action will be released when the reel unit racing is detected.
2. If ATSC operation should continue for 10 seconds without stopping, it will be discontinued and the tape stopped. Normal action will resume if the tape is then ejected and a new tape inserted.
3. If a tape end is detected three times in 16 seconds, the deck will be stopped in order to protect the mechanism. If the "TAPE" button is then pressed, action will resume.
4. Detection of error in data communication.
   This unit operates by continually transmitting data between four ICs (integrated circuits). If something should cause noise to develop in the communication lines, causing an error in the data being transmitted, the deck and tuner will be shut down for two seconds, then returned to the state that they were in before the error developed.
   Note, however, that if the deck or tuner were in the "scan", "frequency up", "frequency down", or "music search" mode immediately prior to the error in data transmission, it will not be returned to that mode. Rather, the deck will enter the "play" mode and the tuner will be tuned to the last station being played.
5. If, for some reason, either loading or unloading should take longer than five seconds, the deck will switch to the opposite mode (loading in the case of unloading, and unloading in the case of loading). If the cassette should somehow become stuck, and the deck switches between loading and unloading three times with neither ejection nor loading taking place, the deck will shut down.
6. If, while the mechanism is operating, the head and gear motors do not go to their prescribed positions in two seconds, they will be released.

• Explanation of operation (Refer to Fig. 31)

1. Cassette insertion → forward play (deck was last run in forward direction; or, after resetting)

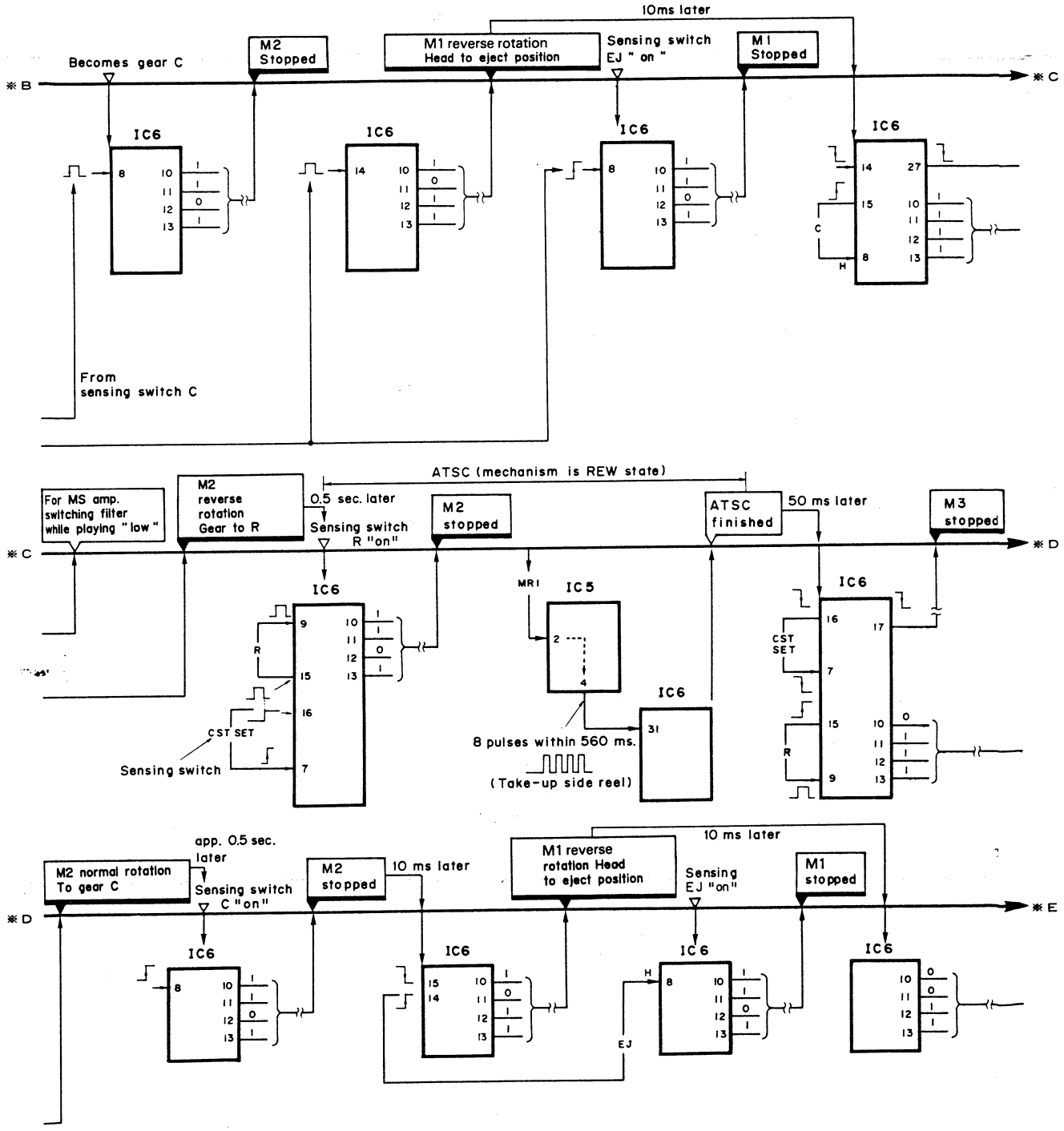


• Control code

IC6 PD4056A / **IC5 PA3019**

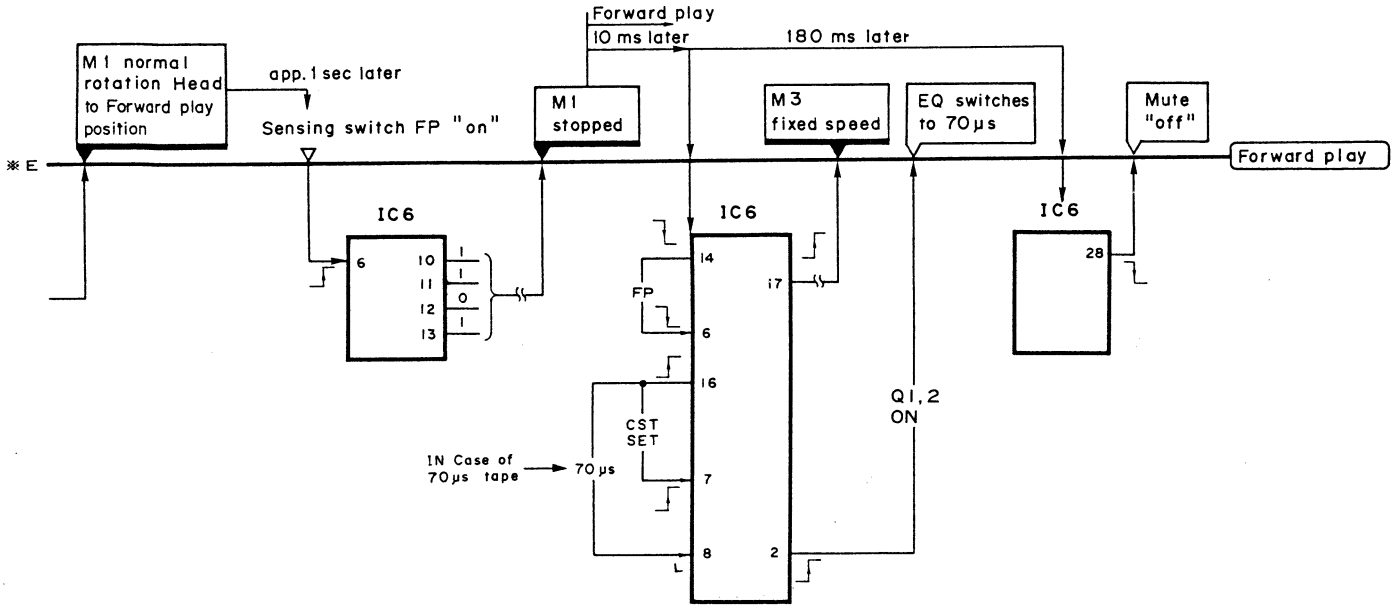
Control mode		Control code				Mechanism action	Output pin voltage					
		10	11	12	13		19	20	21	15	16	17
Output "off"		0	0	0	0	Release	open	open	open	open	open	open
M3	Normal	1	0	0	1	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	0	1	Eject	L	HC	↑	↑	↑	↑
	Fixed speed	1	1	0	1	Normal operation	HO	open	L	↑	↑	↑
M1	Normal	0	0	1	1	Head in forward play direction	↑	↑	↑	HC	L	↑
	Reverse	1	0	1	1	Head in reverse play direction	↑	↑	↑	L	HC	↑
M2	Normal	0	1	1	1	Gear in left "L" direction	↑	↑	↑	Open	L	HC
	Reverse	1	1	1	1	Gear in right "R" direction	↑	↑	↑	↑	HC	L

HC.....app. 7V HO.....Vcc −1.7V Open.....high impedance L.....0V

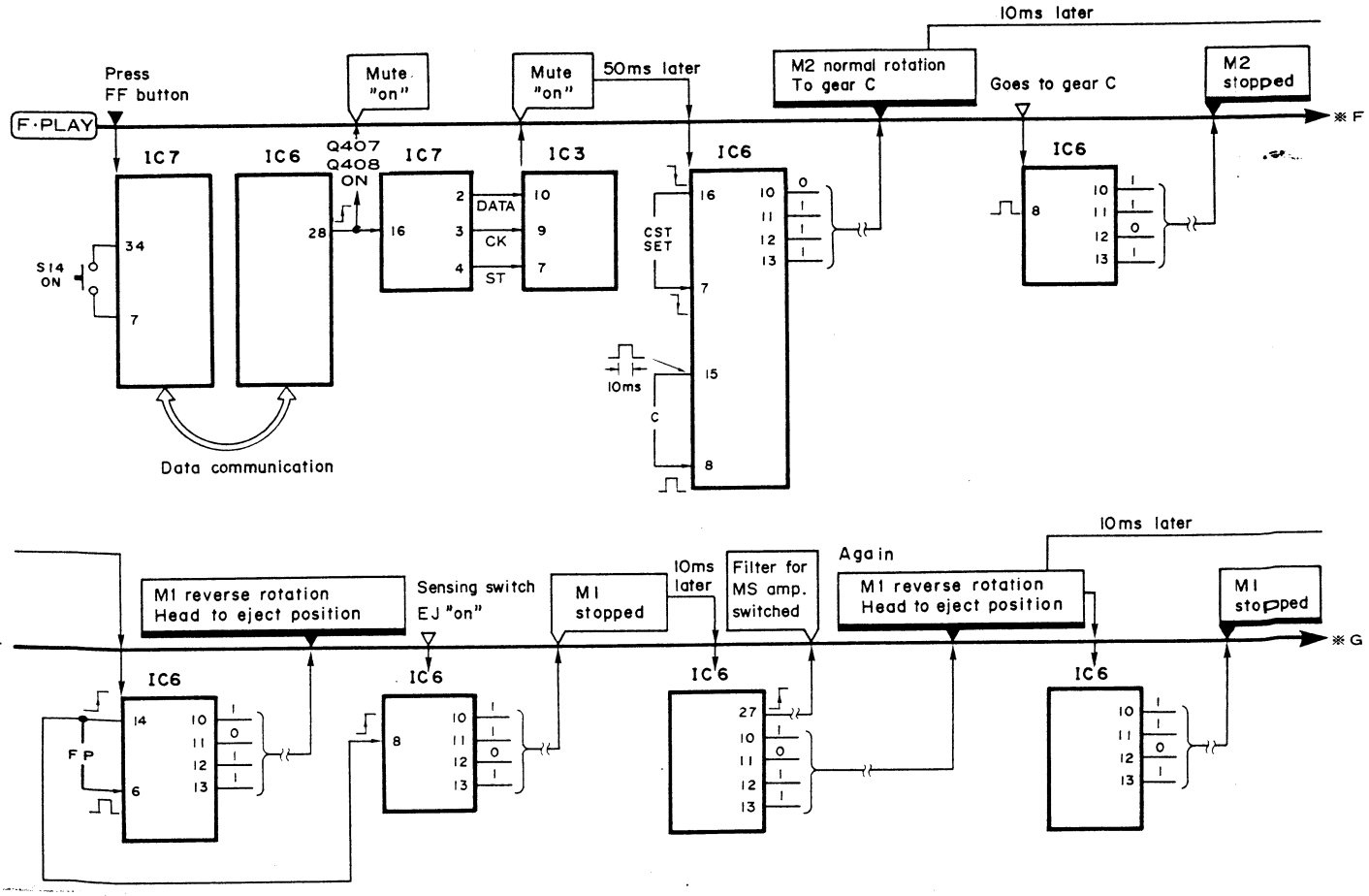


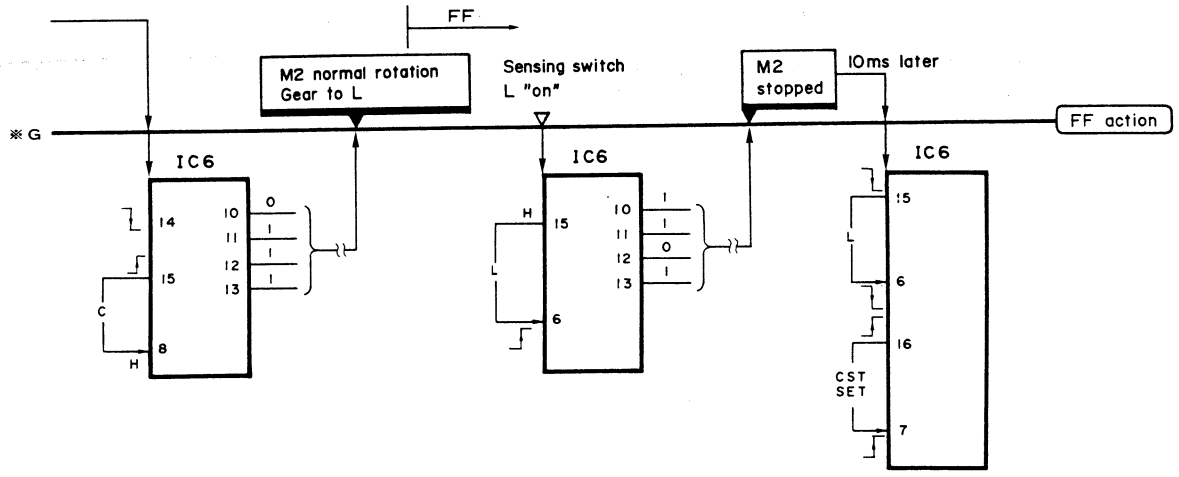
• **Sensing switch**

	Switch name	Description		Switch name	Description
Cassette state	CST IN	Turns "off" when cassette is inserted	Head position	FP	Forward play
	CST SET	Turns "on" when cassette is loaded		MS	MS
	70 μs	"off" for 70 μs tape		EJ	Eject
FF/REW gear position	L	FF when forward direction		RP	Reverse play
	C	Eject or play			
	R	REW when forward direction			

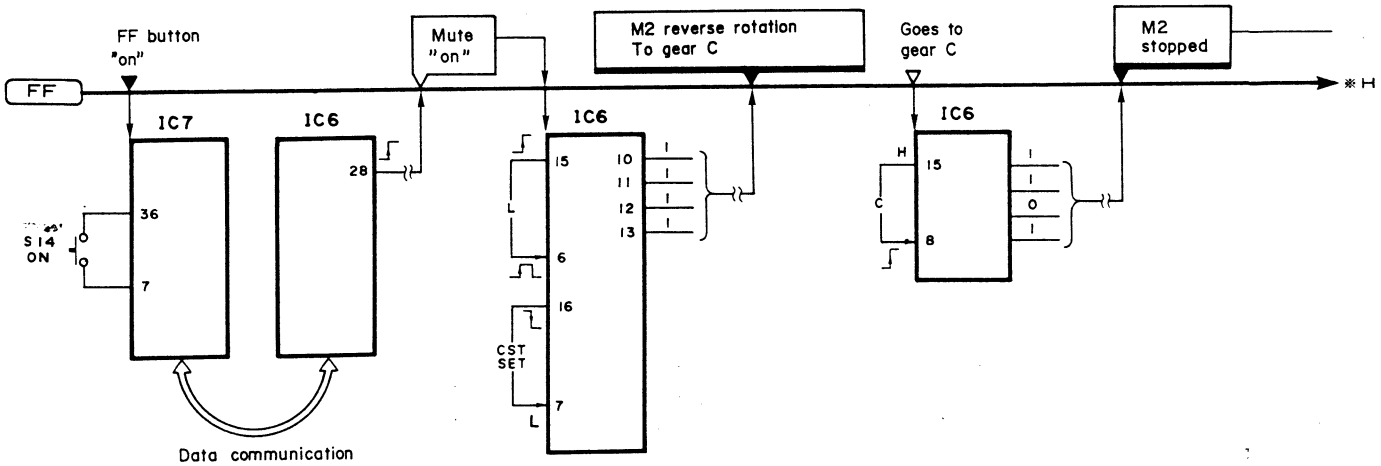

Forward play
10 ms later
180 ms later
M1 normal rotation Head to Forward play position
app. 1 sec later
Sensing switch FP "on"
M1 stopped
M3 fixed speed
EQ switches to 70μs
Mute "off"
※E
Forward play
IC6
FP
CST SET
IN Case of 70μs tape
70μs
Q1, 2 ON

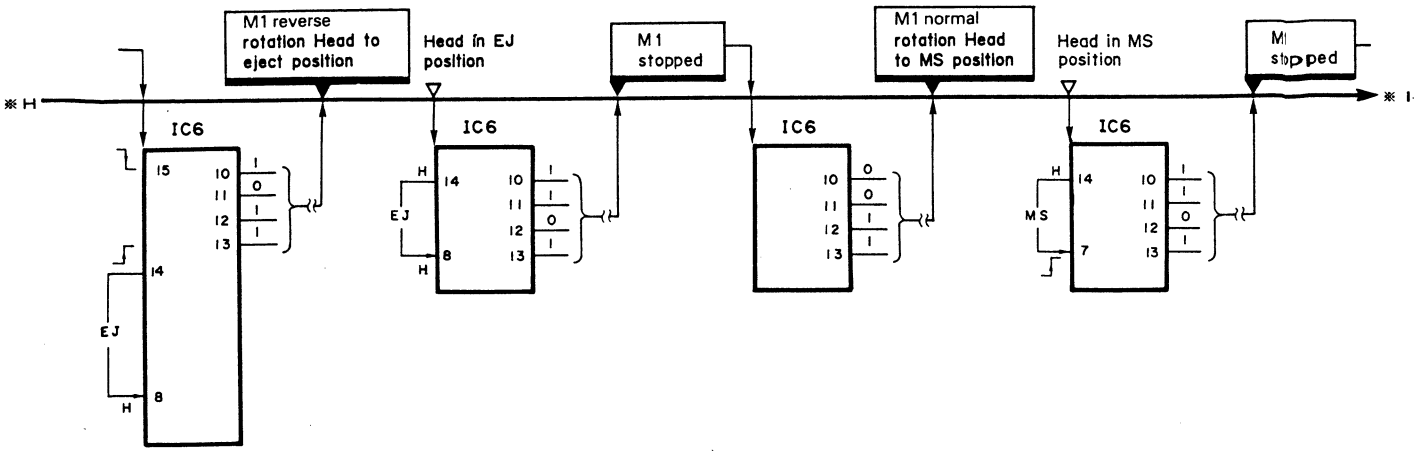
2. F·PLAY → FF

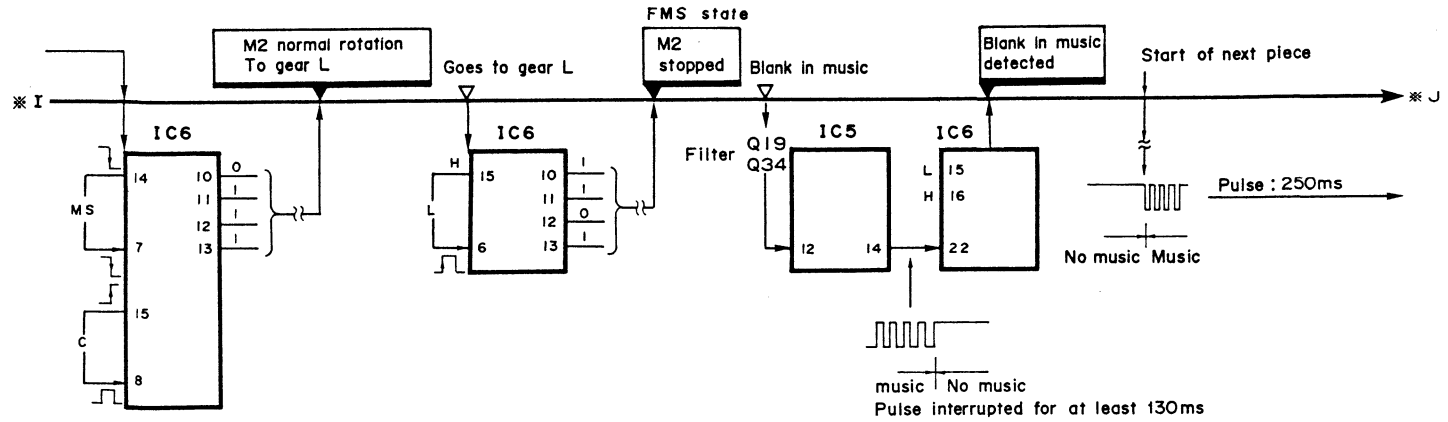

10ms later
Press FF button
Mute "on"
Mute "on"
50ms later
M2 normal rotation To gear C
Goes to gear C
M2 stopped
F·PLAY
※F
IC7
IC6
Q407 Q408 ON
IC3
DATA
CK
ST
S14 ON
CST SET
10ms
Data communication
M1 reverse rotation Head to eject position
Sensing switch EJ "on"
M1 stopped
10ms later
Filter for MS amp. switched
Again
M1 reverse rotation Head to eject position
M1 stopped
※G
FP

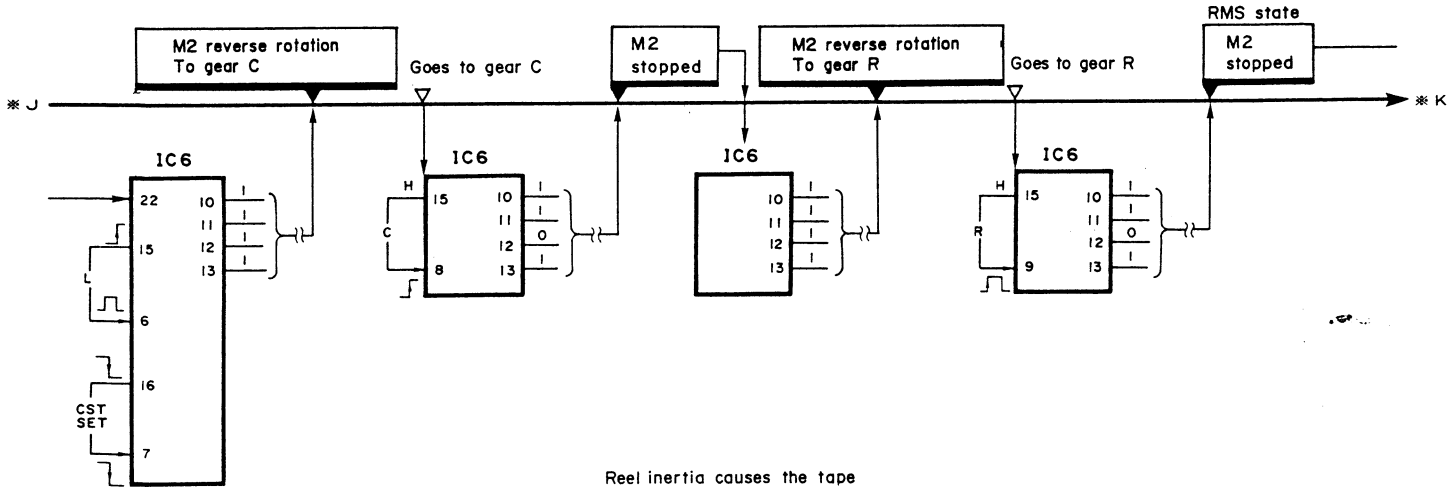

FF
M2 normal rotation
Gear to L
Sensing switch
L "on"
M2
stopped
10ms later
FF action
※G
IC6
IC6
IC6

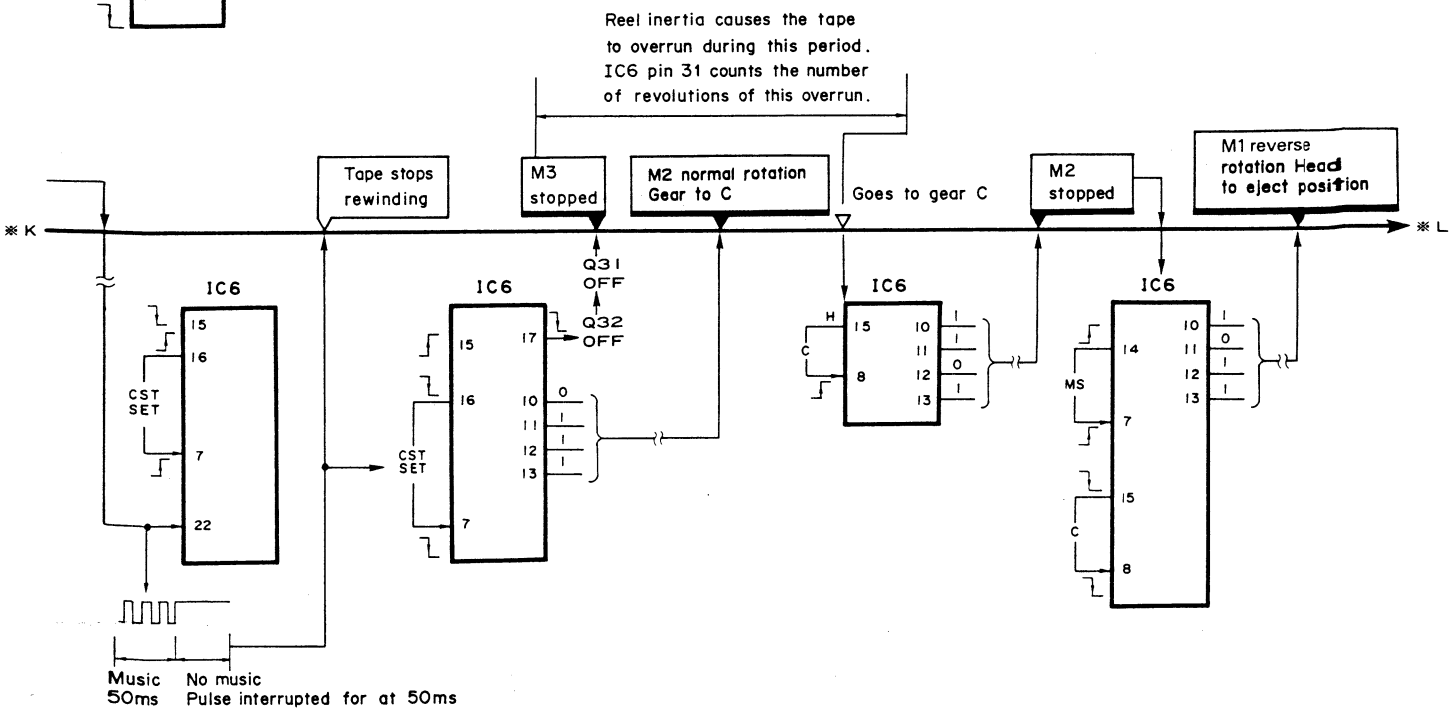
3. FF→F-MS

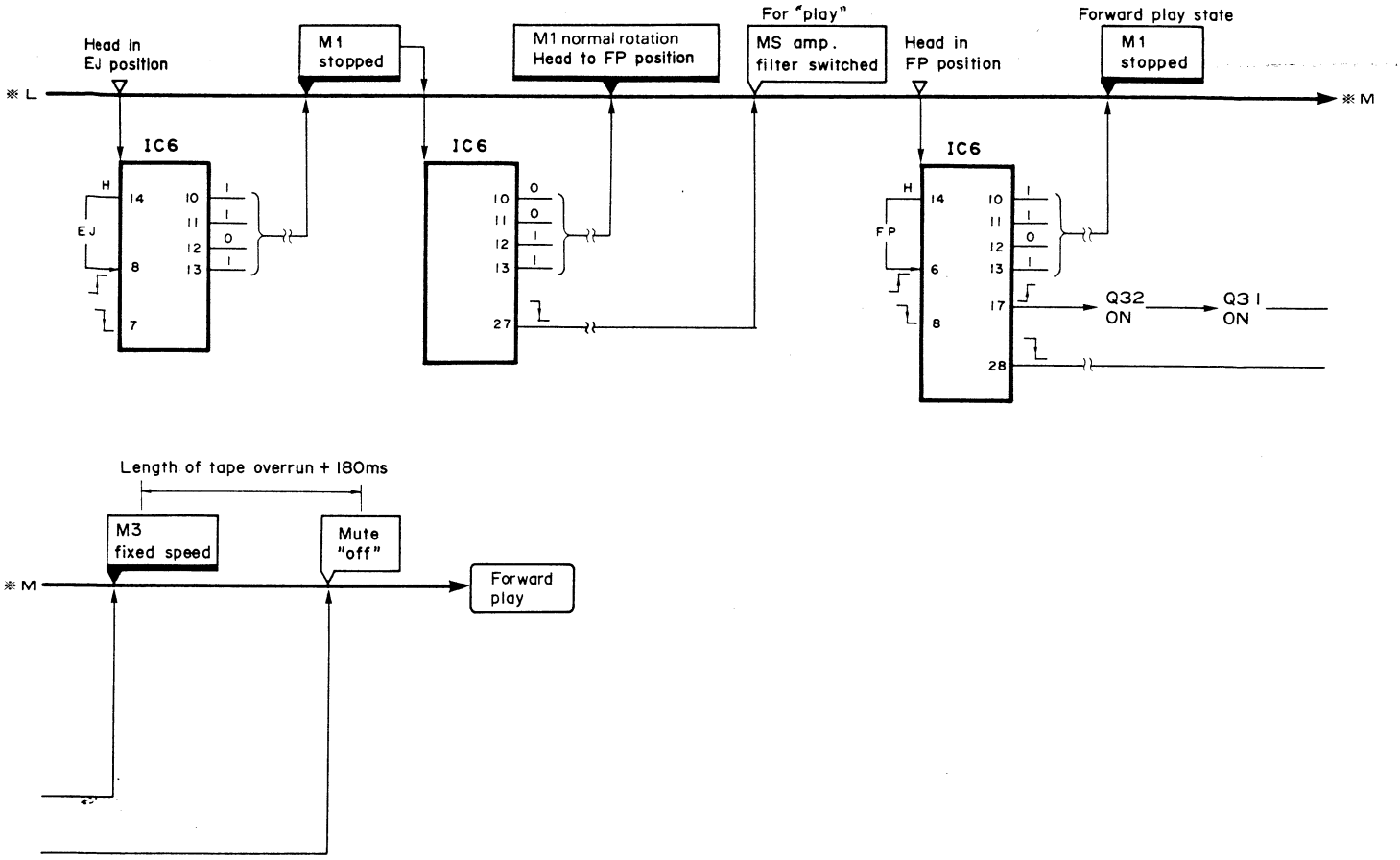

FF button
"on"
Mute
"on"
M2 reverse rotation
To gear C
Goes to
gear C
M2
stopped
FF
※H
IC7
IC6
IC6
IC6
S14
ON
Data communication
CST
SET


M1 reverse
rotation Head to
eject position
Head in EJ
position
M1
stopped
M1 normal
rotation Head
to MS position
Head in MS
position
M1
stopped
※H
※I
IC6
IC6
IC6
IC6
EJ
EJ
MS

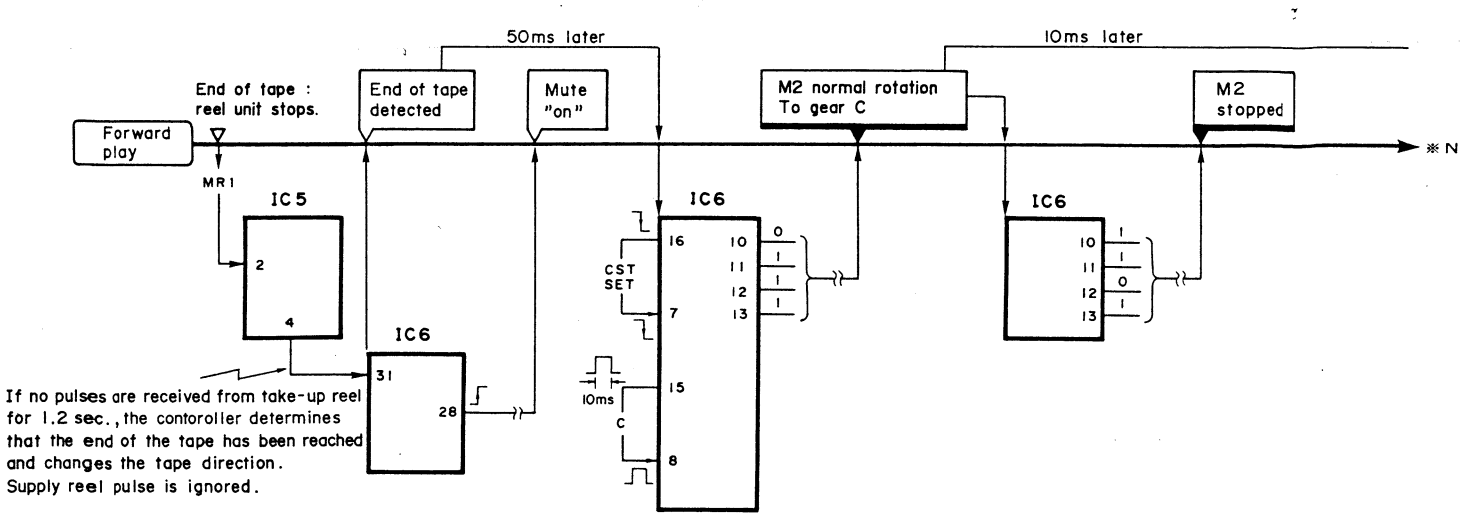

FMS state
M2 normal rotation
To gear L
Goes to gear L
M2
stopped
Blank in music
Blank in music
detected
Start of next piece
※I
※J
IC6
IC6
IC5
IC6
Filter
Q19
Q34
MS
Pulse : 250ms
No music Music
music No music
Pulse interrupted for at least 130ms

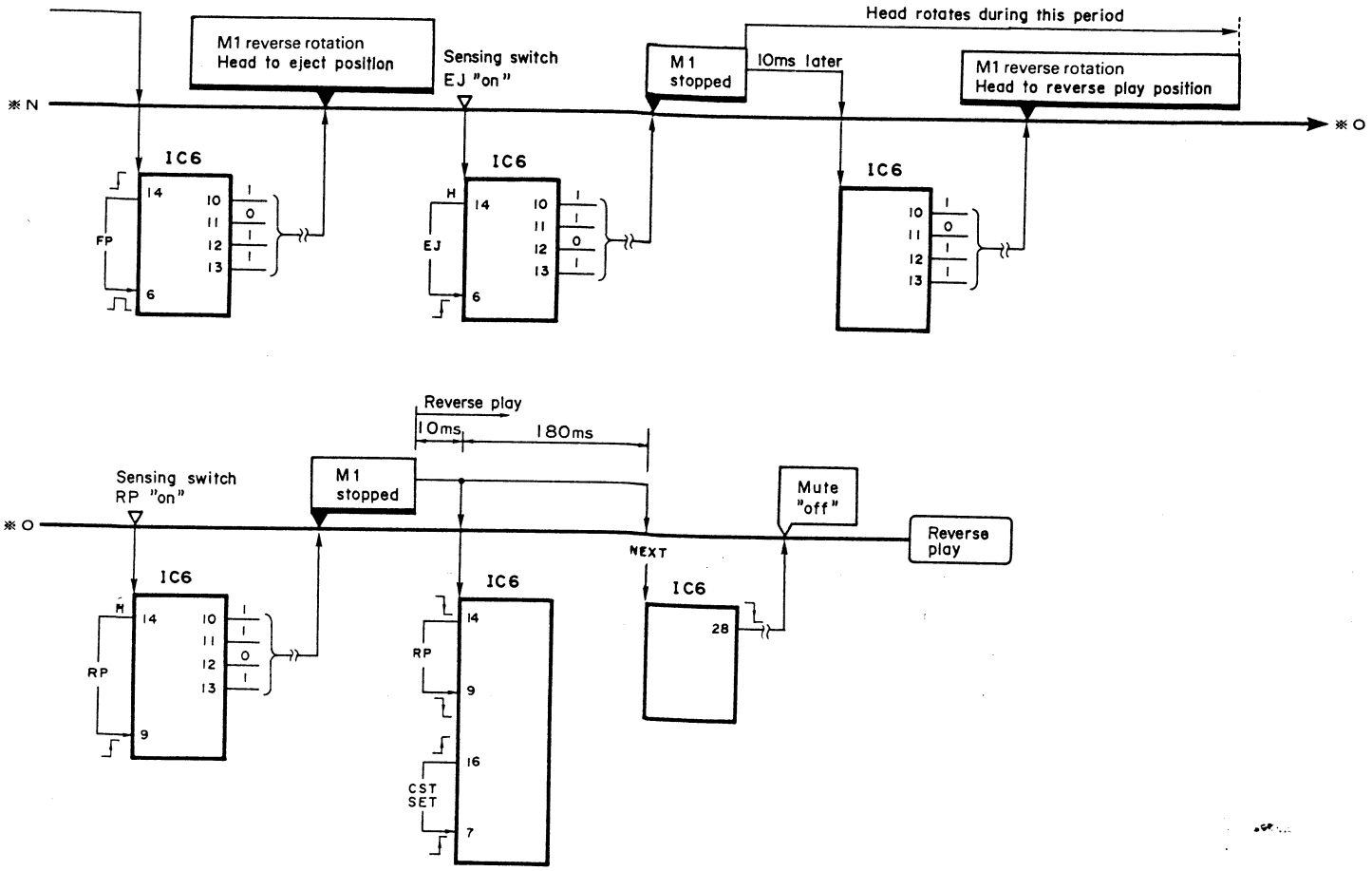

RMS state
M2 reverse rotation
To gear C
Goes to gear C
M2
stopped
M2 reverse rotation
To gear R
Goes to gear R
M2
stopped
※J
※K
IC6
IC6
IC6
IC6
CST
SET


Reel inertia causes the tape
to overrun during this period.
IC6 pin 31 counts the number
of revolutions of this overrun.
Tape stops
rewinding
M3
stopped
M2 normal rotation
Gear to C
Goes to gear C
M2
stopped
M1 reverse
rotation Head
to eject position
※K
※L
Q31
OFF
Q32
OFF
IC6
IC6
IC6
IC6
CST
SET
CST
SET
MS
Music
50ms
No music
Pulse interrupted for at 50ms

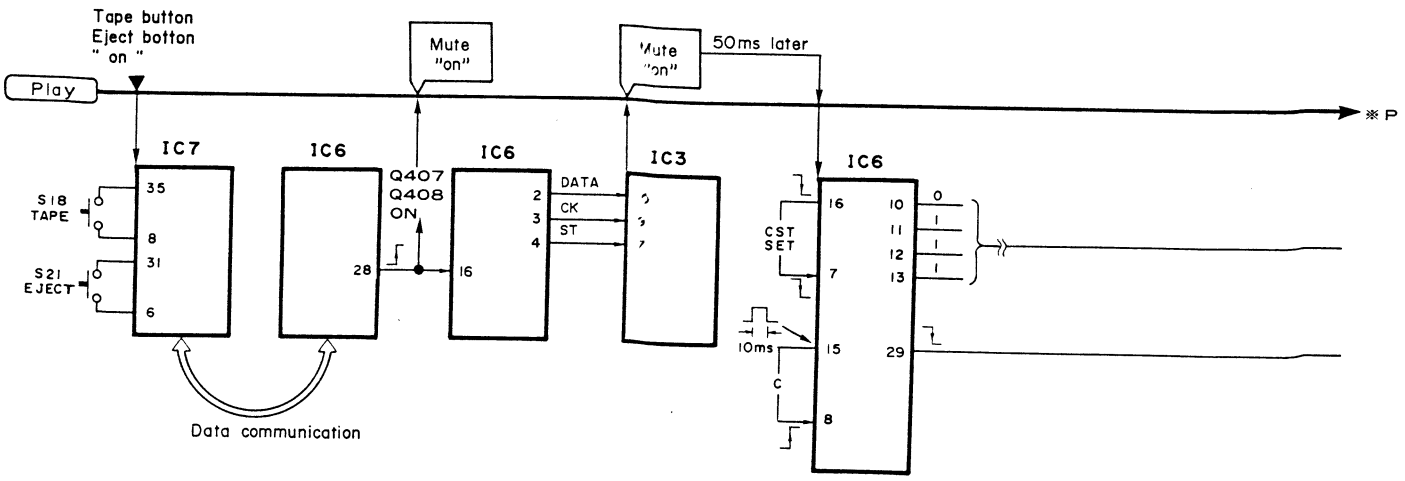


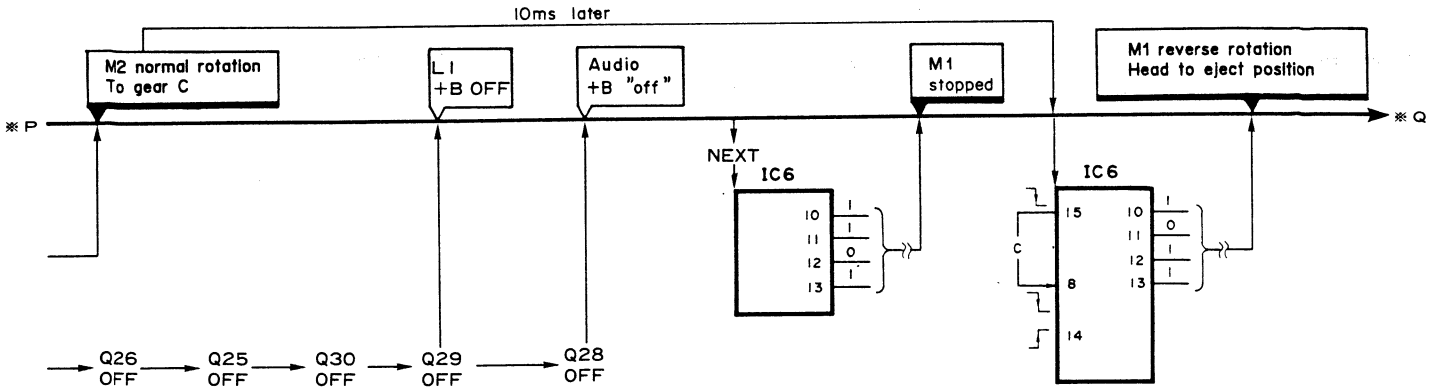
4. Forward Play → Reverse Play

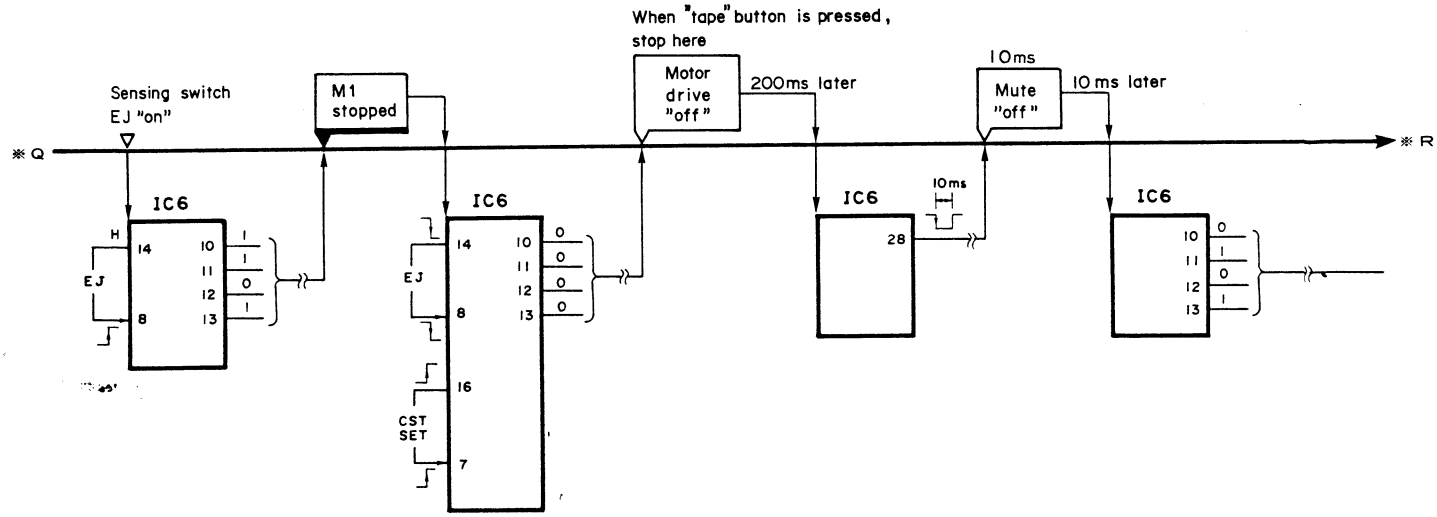


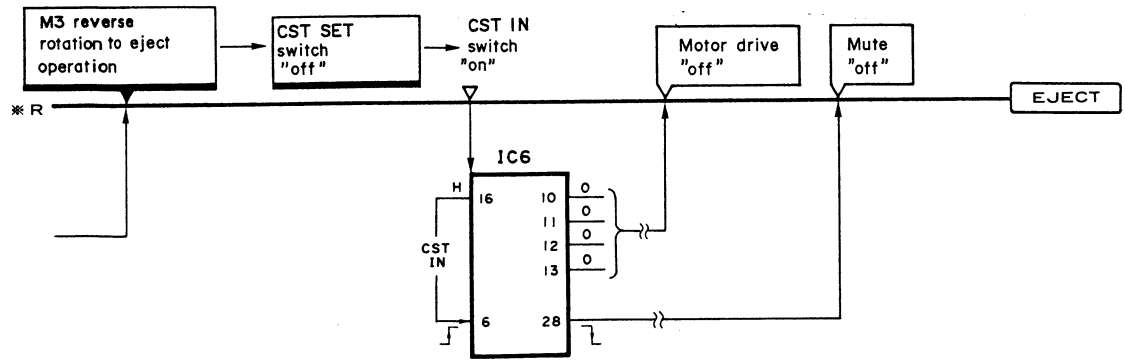

Head rotates during this period
M1 reverse rotation
Head to eject position
Sensing switch
EJ "on"
M1
stopped
10ms later
M1 reverse rotation
Head to reverse play position
※N
※O
IC6
FP
EJ
H
Reverse play
10ms
180ms
Sensing switch
RP "on"
M1
stopped
Mute
"off"
Reverse
play
NEXT
RP
CST
SET

5. Play → Eject


Tape button
Eject botton
" on "
Play
Mute
"on"
Mute
"on"
50ms later
※P
IC7
IC6
IC6
IC3
IC6
S18
TAPE
S21
EJECT
Q407
Q408
ON
DATA
CK
ST
CST
SET
10ms
Data communication


10ms later
M2 normal rotation
To gear C
L I
+B OFF
Audio
+B "off"
M1
stopped
M1 reverse rotation
Head to eject position
※P
※Q
NEXT
IC6
Q26
OFF
Q25
OFF
Q30
OFF
Q29
OFF
Q28
OFF


When "tape" button is pressed,
stop here
Sensing switch
EJ "on"
M1
stopped
Motor
drive
"off"
200ms later
10ms
Mute
"off"
10 ms later
※Q
※R
IC6
EJ
CST
SET
10ms


M3 reverse
rotation to eject
operation
CST SET
switch
"off"
CST IN
switch
"on"
Motor drive
"off"
Mute
"off"
EJECT
※R
IC6
CST
IN

7. ADJUSTMENT

7.1 DOLBY NR LEVEL ADJUSTMENT

• **Connection Diagram**

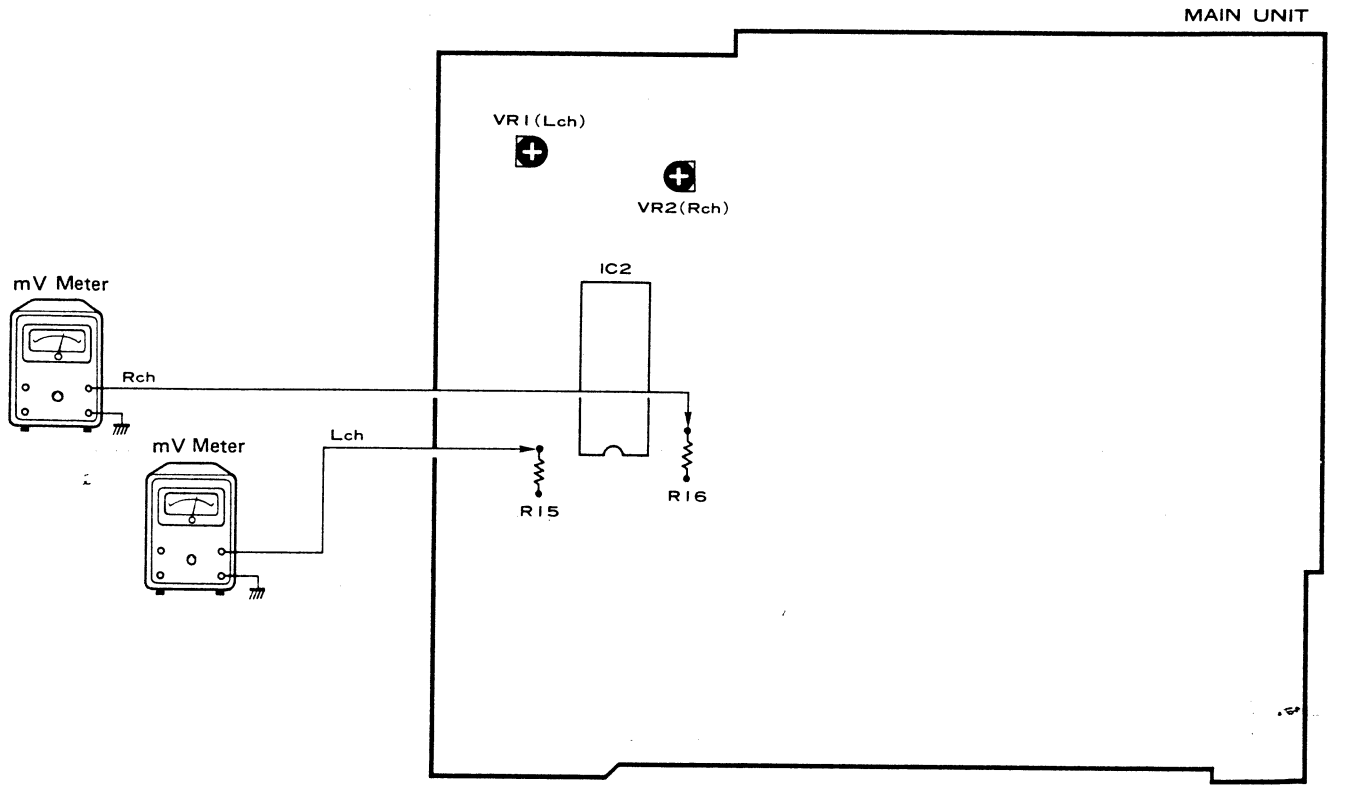


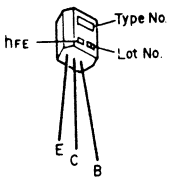
Fig. 32

• **To Adjust**

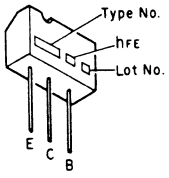
1. Set Dolby NR switch in "off" position.
2. Reproduce CT-150 (400 Hz, 200 nwb/m). Adjust VR 1 (left channel) and VR 2 (right channel) so that the mV meters show 300 mV. Adjustment accuracy should be ±1 dB.

• ICs and Transistors

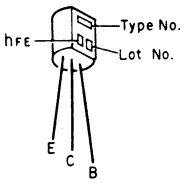
2SA933S
2SC1740S
2SC2458
2SC3113



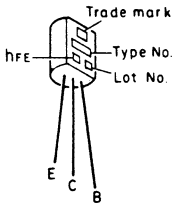
2SD1055F



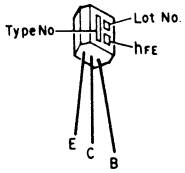
2SA934
2SC2060



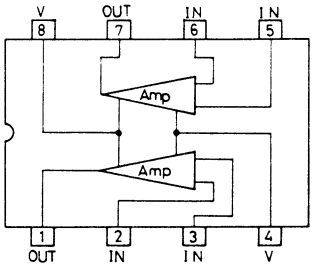
2SA838



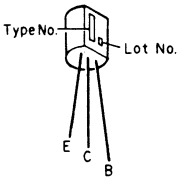
2SA608SP



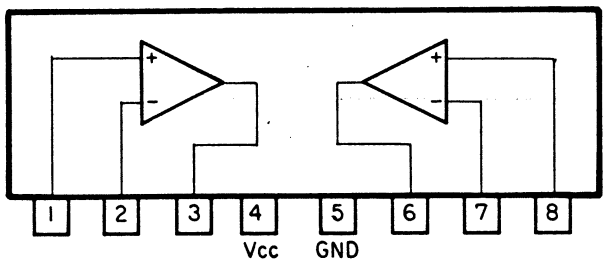
TA75558P



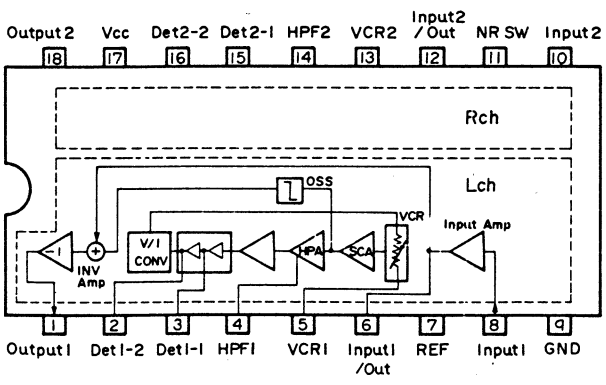
2SA1005



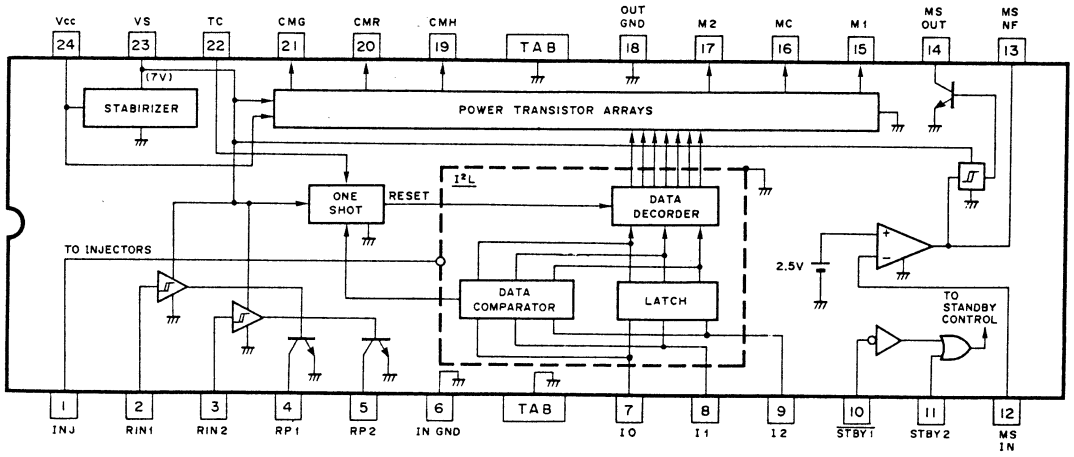
MB3106M



HA12047



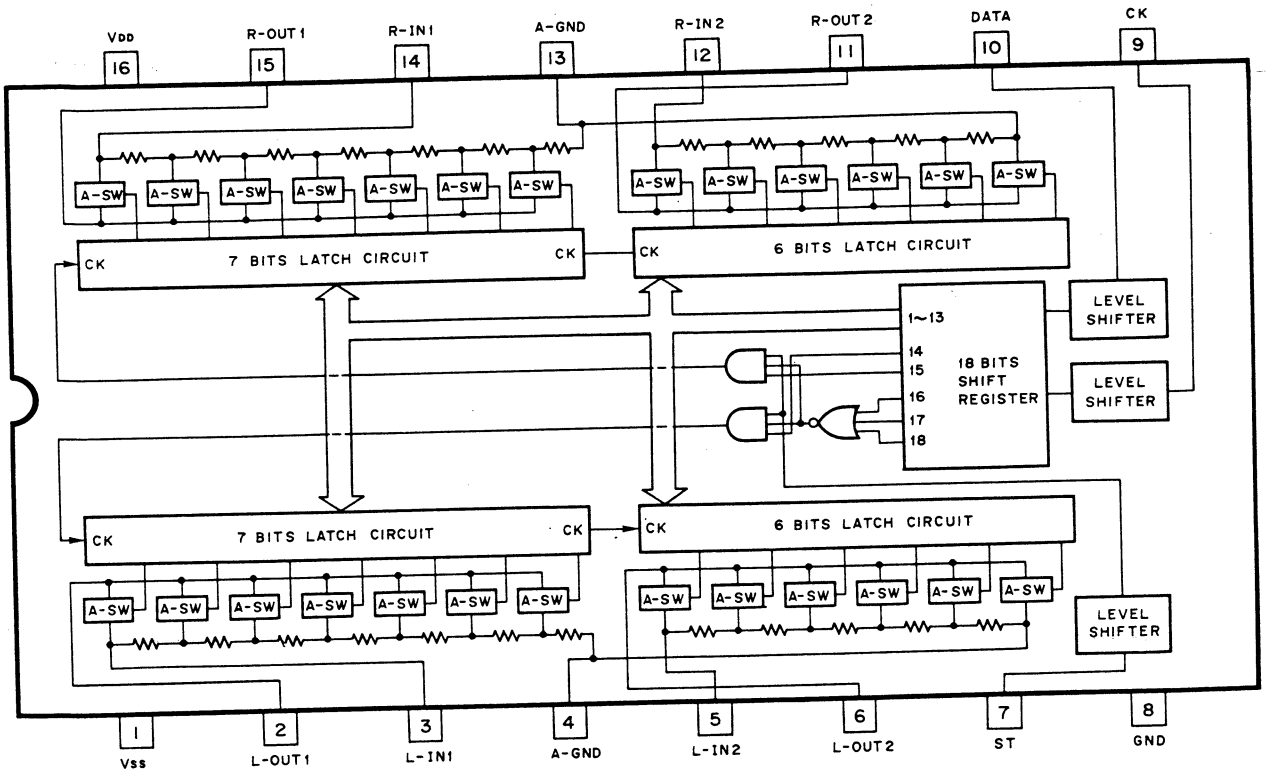
PA 3019



• Pin Function (PA 3019)

Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	"Internal logic" (I^2L) power source
2	RIN1	Input	Input pin for reel unit rotation sensor (MR 1)
3	RIN2	Input	Input pin for reel unit rotation sensor (MR 2)
4	RP1	Output	Output for wave form signal from reel sensor input 1 (pin 2)
5	RP2	Output	Output for wave form signal from reel sensor input 2 (pin 3)
6	IN GND	—	Low signal system ground pin
7	I0	Input	Motor control logic input pin
8	I1	Input	
9	I2	Input	
10	$\overline{\text{STBY1}}$	Input	Standby control—switches IC power circuit off at active low (0.7V or less).
11	STBY2	Input	Standby control—switches IC power circuit off at active high (3.5V or more).
12	MSIN	Input	Input (inverted) pin for MS amp.
13	MSNF	Output/ Input	MS amp. output and MS Schmitt circuit input
14	MSOUT	Output	MS Schmitt circuit output—when signal level at MSNF pin exceeds 0 dBm, pulse is outputted open when below 0 dBm
15	M1	Output	Drive output "+" pin for head drive motor M1
16	MC	Output	Drive output common pin for motors M1 and M2
17	M2	Output	Drive output "+" pin for drive motor M2 ("FF/REW" switching gear)
18	OUT GND	—	Motor drive circuit ground pin
19	CMH	Output	Drive output H (+) pin for capstan motor M3 output voltage: During speed control: app. Vcc−1.7V During loading and eject: 6.9V
20	CMR	Output	Drive output R pin for capstan motor M3 During speed control: open During loading: app. 0V During eject: app. 7V
21	CMG	Output	Drive output GND (−) pin for capstan motor M3 During speed control: app. 0V During loading and eject: open
22	TC	Output	Pin for capacitor for setting timer to switch power transistor off in a set time when logic inputs I0, I1, I2 change.
23	VS	Output	Power source for reel rotation sensor—app. 7V
24	Vcc	Input	IC power supply pin

TC 9154P

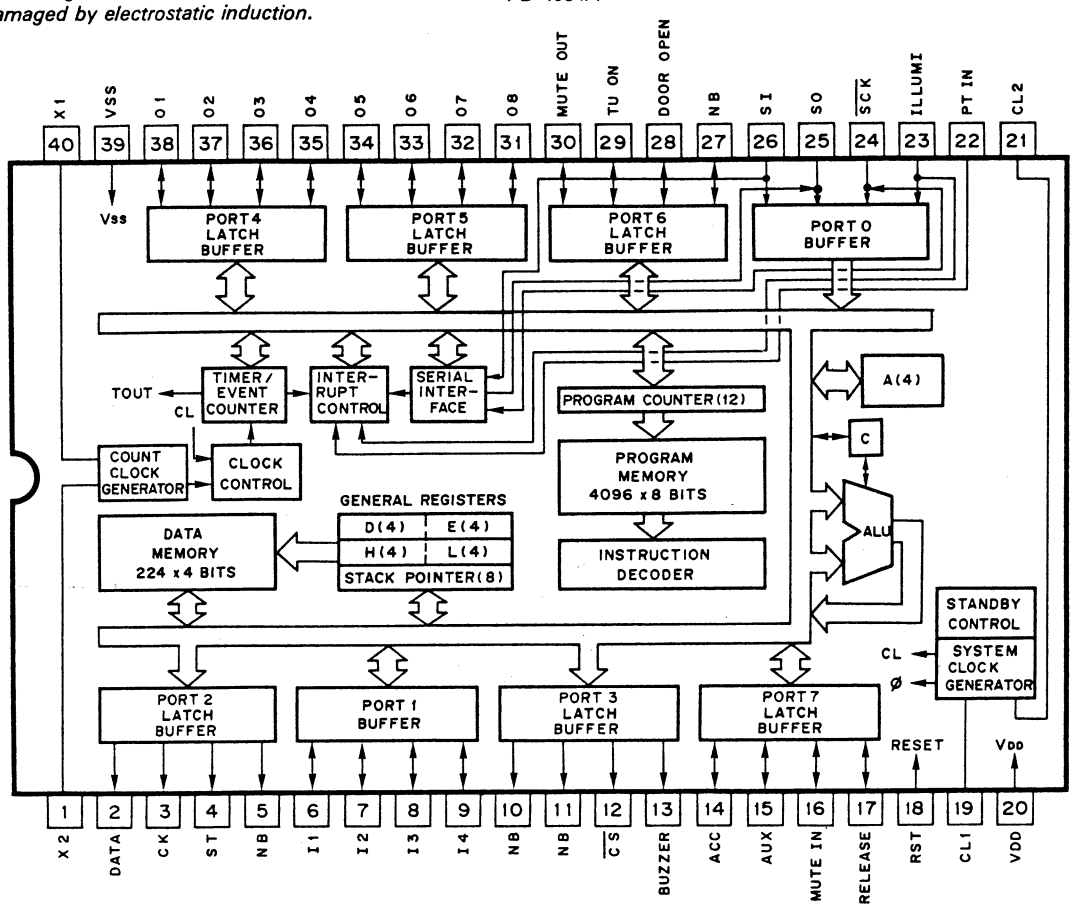


• Pin Function (TC9154P)

Pin No.	Pin Name	I/O	Function and Operation
1	Vss	—	(−) power source pin
2	L-OUT1	Output	10 dB step attenuation output
15	R-OUT1	Output	Signal received at IN, reduced from 0 dB to −60 dB in 7 steps of 10 dB
3	L-IN1	Input	10 dB step attenuation input
14	R-IN1	Input	
4	A-GND	—	AC ground
13	A-GND	—	
5	L-IN2	Input	2 dB step attenuation input
12	R-IN2	Input	
6	L-OUT2	Output	2 dB step attenuation output
11	R-OUT2	Output	Signal received at IN, reduced from 0 dB to −8 dB in 5 steps of 2 dB
7	ST	Input	Strobe input pin—attenuation & channel selection signals received from the DATA and CK terminals are latched by going "H" level at this pin—if "H" level not reached at this pin, prior data is used.
8	GND	—	
9	CK	Input	Input pin for clock used when receiving data from the DATA pin
10	DATA	Input	Attenuation and channel selection data input pin—inputted as 18 bit CK signal.
16	VDD	—	(+) power source pin

*IC's marker by *are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

*PD 4054A

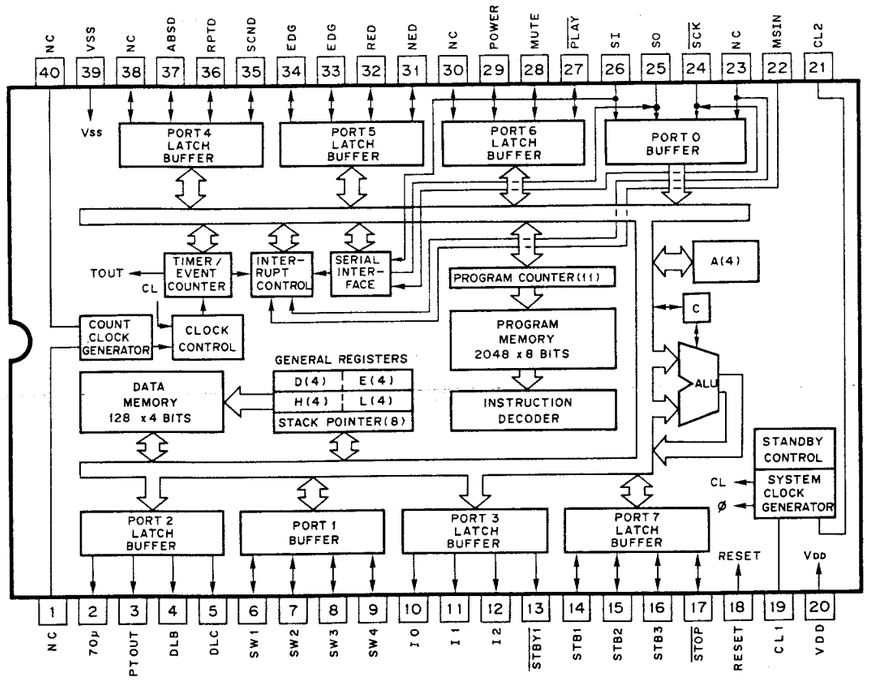


• Pin Function (PD4054A)

Pin No.	Pin Name	I/O	Function and Operation
1	X2	Output	Pin for counter clock oscillator crystal
2	DATA	Output	Pin for driving electronic volume control IC and TC 9154P when transmitting serially
3	CK	Output	
4	ST	Output	
5	NB	Output	Open
6–9	I1–I4	Input	Keyboard switch matrix input
10, 11	NB	Output	Open
12	$\overline{CS}$	Output	Activates display controller IC
13	BUZZER	Output	Outputs 3.8 kHz when control buttons are switched on or off, etc.
14	ACC	Input	Connects to automobile Acc. power source—"H" at app. 5V or more.
15	AUX	Input	"H" when device connected to AUX pin is "on"
16	MUTE IN	Input	When "H", attenuation of serial transmission of electronic volume is maximized.
17	RELEASE	Input	When "H", release command is sent to deck controller—FX-K5 is GND
18	RST	Input	Reset to start when back up power source is "on" or reset button pushed
19	CL1	Input	Pin for system clock oscillator crystal—external clock input
20	VDD	—	Power source pin
21	CL2	Output	Pins for the capacitor and resistor for the system clock oscillator.
22	PT IN	Input	Input pin for deck controller pulse (100 Hz, DUTY 50% output)
23	ILLUMI	Input	Connected to "small-lamp-linked" power source

Pin No.	Pin Name	I/O	Function and Operation
24	$\overline{SCK}$	Input/ Output	Pin for synchronized clock for serial transmission among the deck, tuner and display controllers
25	SO	Output	Data output pin for serial transmission among the deck, tuner and display controllers
26	SI	Input	Data input pin for serial transmission between the deck and tuner controllers
27	NB	Output	Alarm output (FX-K5SDK/WG only)
28	DOOR OPEN	Output	Not used at present
29	TU ON	Output	"H" when tuner is "on"
30	MUTE OUT	Output	Not used at present
31–38	O1–O8	Output	Keyboard switch matrix output
39	Vss	—	Power source GND
40	X1	Input	Pin for counter clock oscillator crystal—external clock input

*PD 4056A


NC VSS NC ABSD RPTD SCND EDG EDG RED NED NC POWER MUTE PLAY SI SO SCK NC MSIN CL2
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21
Vss
PORT4 LATCH BUFFER
PORT5 LATCH BUFFER
PORT6 LATCH BUFFER
PORT 0 BUFFER
TOUT
TIMER / EVENT COUNTER
CL
INTER-RUPT CONTROL
SERIAL INTER-FACE
PROGRAM COUNTER(11)
A(4)
C
COUNT CLOCK GENERATOR
CLOCK CONTROL
GENERAL REGISTERS
PROGRAM MEMORY 2048 x8 BITS
DATA MEMORY 128 x4 BITS
D(4) E(4)
H(4) L(4)
STACK POINTER(8)
INSTRUCTION DECODER
ALU
STANDBY CONTROL
SYSTEM CLOCK GENERATOR
CL
Ø
PORT 2 LATCH BUFFER
PORT 1 BUFFER
PORT 3 LATCH BUFFER
PORT7 LATCH BUFFER
RESET
VDD
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
NC TOμ PTOUT DLB DLC SW1 SW2 SW3 SW4 I0 I1 I2 STBY1 STB1 STB2 STB3 STOP RESET CL1 VDD

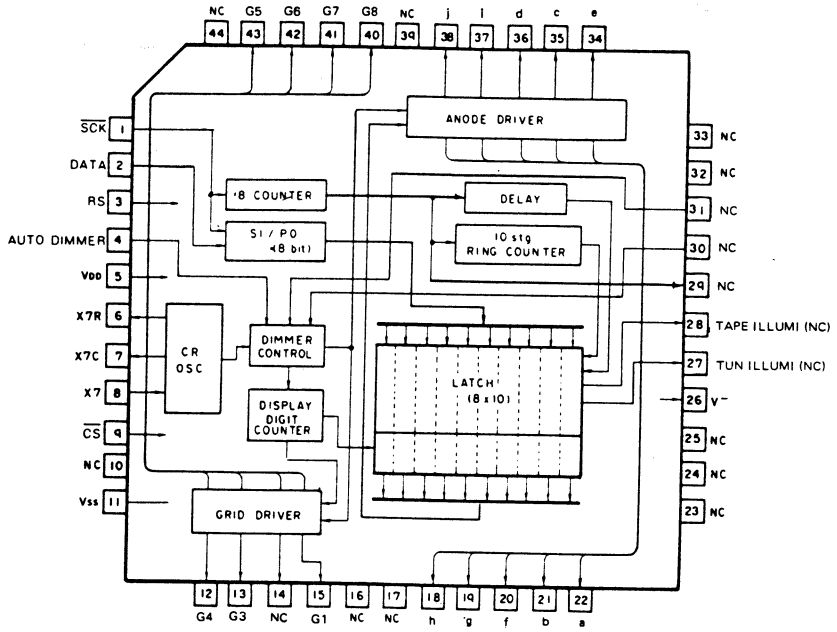
• Pin Function (PD4056A)

Pin No.	Pin Name	I/O	Function and Operation
1	NC	Output	Open
2	70 μs	Output	Pin for switching the 70 μs equalizer. Active "H."
3	PT OUT	Output	100 Hz Duty 50% pulse output pin. This signal is output during reset operation and while Acc is not off.
4	DLB	Output	Dolby B switching output pin. Dolby B at "H" level.
5	DLC	Output	Not used at present.
6–9	SW1–SW4	Input	Mechanism control switch matrix input pin
10–12	I0–I2	Output	Motor drive IC (PA3019) control signal output pin
13	$\overline{STBY1}$	Output	• I0, I1, I2: control code output • $\overline{STBY1}$: PA3019 output "off." Active "L."
14–16	STB1–STB3	Output	Mechanism control switch matrix strobe output pin. Active "H" STB1: head position sensor STB2: FF/REW gear position sensor STB3: Loading and 70 μs sensor
17	$\overline{STOP}$	Output	Pin for stopping capstan motor. Is "L" when entering the "play" or "release" mode from FF/REW. Active "L."
18	RESET	Input	Reset input pin—active "H."
19	CL1	Input	Pin for system clock oscillator circuit. Used to connect a capacitor and a resistor.
20	V_{DD}	—	Power source pin
21	CL2	Output	Pin for system clock oscillator circuit. Used to connect a capacitor and a resistor.
22	MS IN	Input	Music detection signal input pin for MS: No music—"L" level input; Music—pulse input.
23	NC	—	Fixed at GND level
24	$\overline{SCK}$	Input/ Output	Input/output pin for shift clock For serial interface
25	SO	Output	Serial interface data output pin
26	SI	Input	Serial interface data input pin
27	$\overline{PLAY}$	Output	MS amp. filter switching output pin. "L" level when in "play."
28	MUTE	Output	Mute signal output pin. Active "H."
29	POWER	Output	Output pin for power source control. "H" level when deck is "on."
30	NC	—	Fixed at GND level
31	NED	Input	Forward side reel rotation pulse input pin. Monitors tape end.
32	RED	Input	Reverse side reel rotation pulse input pin. Monitors tape end.
33, 34	EDG	Input	Fixed at GND level
35	SCND	Input	Mode set input pin
36	RPTD	Input	• SCND: SCAN function cancelled at "H" level.
37	ABSD	Input	• RPTD: repeat function cancelled at "H" level.
38	NC	Input	• ABSD: ABS function at "H" level. • NC: fixed at level V_{DD}.
39	Vss	—	
40	NC	—	Fixed at GND level

Pin Functio

Pin No.	Pin
1	$\overline{SCK}$
2	DATA
3	RS
4	AUTO
5	V_{DD}
6 ~ 8	
9	$\overline{CS}$
10	NC
11	Vss
12 ~ 15	G4 ~
16、17	NC
18 ~ 22	h, g,
23 ~ 25	NC
26	V–
27	TUN
28	TAPE
29 ~ 31	NC
32、33	NC
34 ~ 36	e, c,
37、38	i, j
39	NC
40 ~ 43	G8 ~
44	NC

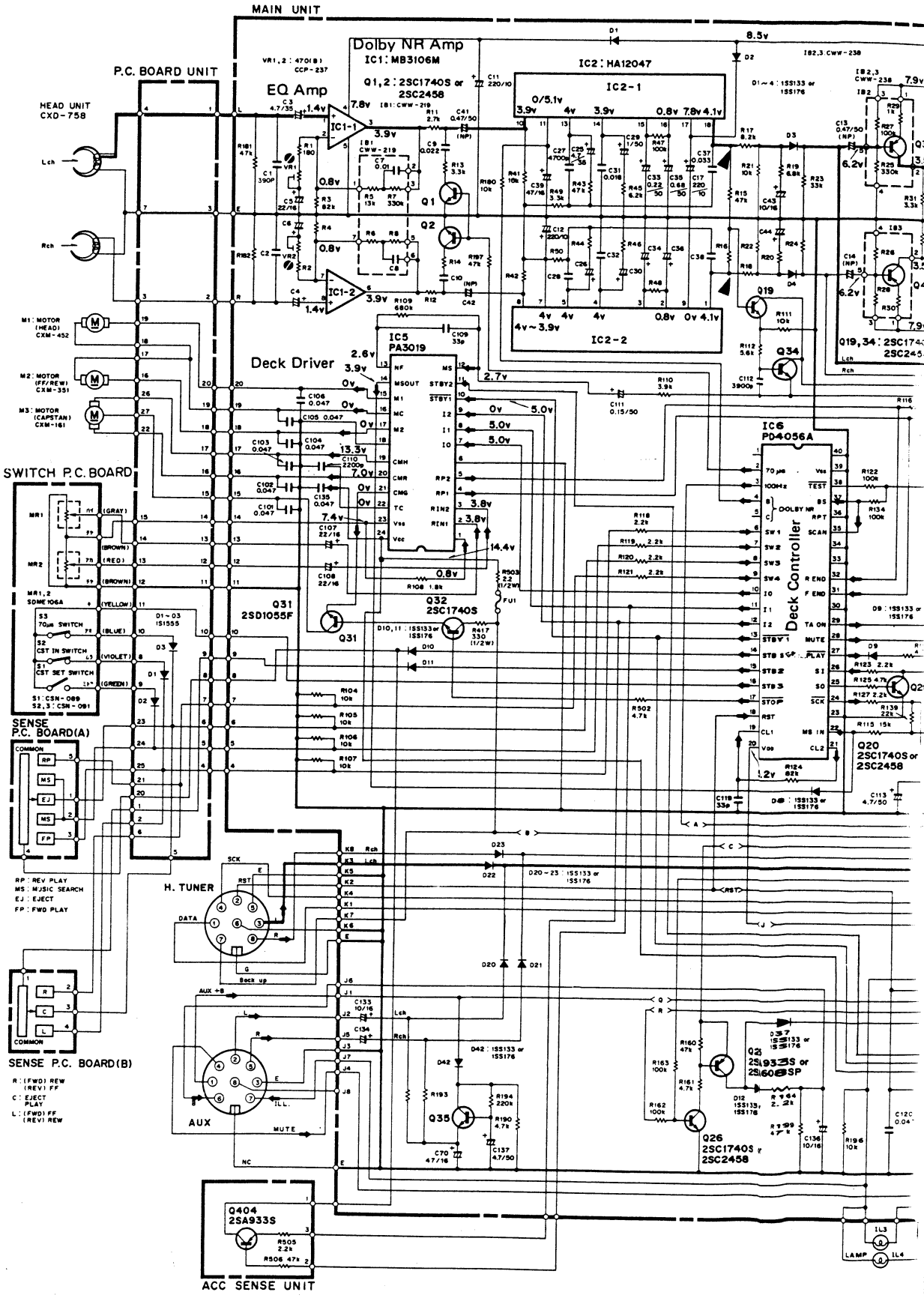
*PD 7005



Pin Functions (PD7005)

Pin No.	Pin Name	I/O	Function and Operation
1	$\overline{SCK}$	Input	Serial interface system clock input pin. Active "L".
2	DATA	Input	Data input pin
3	RS		Reset pin
4	AUTO DIMMER		Not used
5	VDD		Power supply pin. 5V ± 0.3V
6 ~ 8			For oscillator circuit
9	$\overline{CS}$	Input	Chip selector signal input pin. Active "L".
10	NC		
11	Vss		GND
12~15	G4~G1	Output	FL grid outputs
16、17	NC		
18~22	h, g, f, b, a	Output	FL anode outputs
23~25	NC		
26	V−	Output	Grid output. Negative voltage Output pin for pull-down resistor.
27	TUN ILLUMI.	Output	TUN illuminator ON output pin ("H" level). Not used
28	TAPE ILLUMI.	Output	TAPE illuminator ON output pin ("H" level). Not used
29~31	NC		Not used
32、33	NC		
34~36	e, c, d	Output	FL anode outputs
37、38	i, j	Output	
39	NC		
40~43	G8~G5	Output	FL grid outputs
44	NC		

8. SCHEMATIC CIRCUIT DIAGRAM (FX-K5/EW)



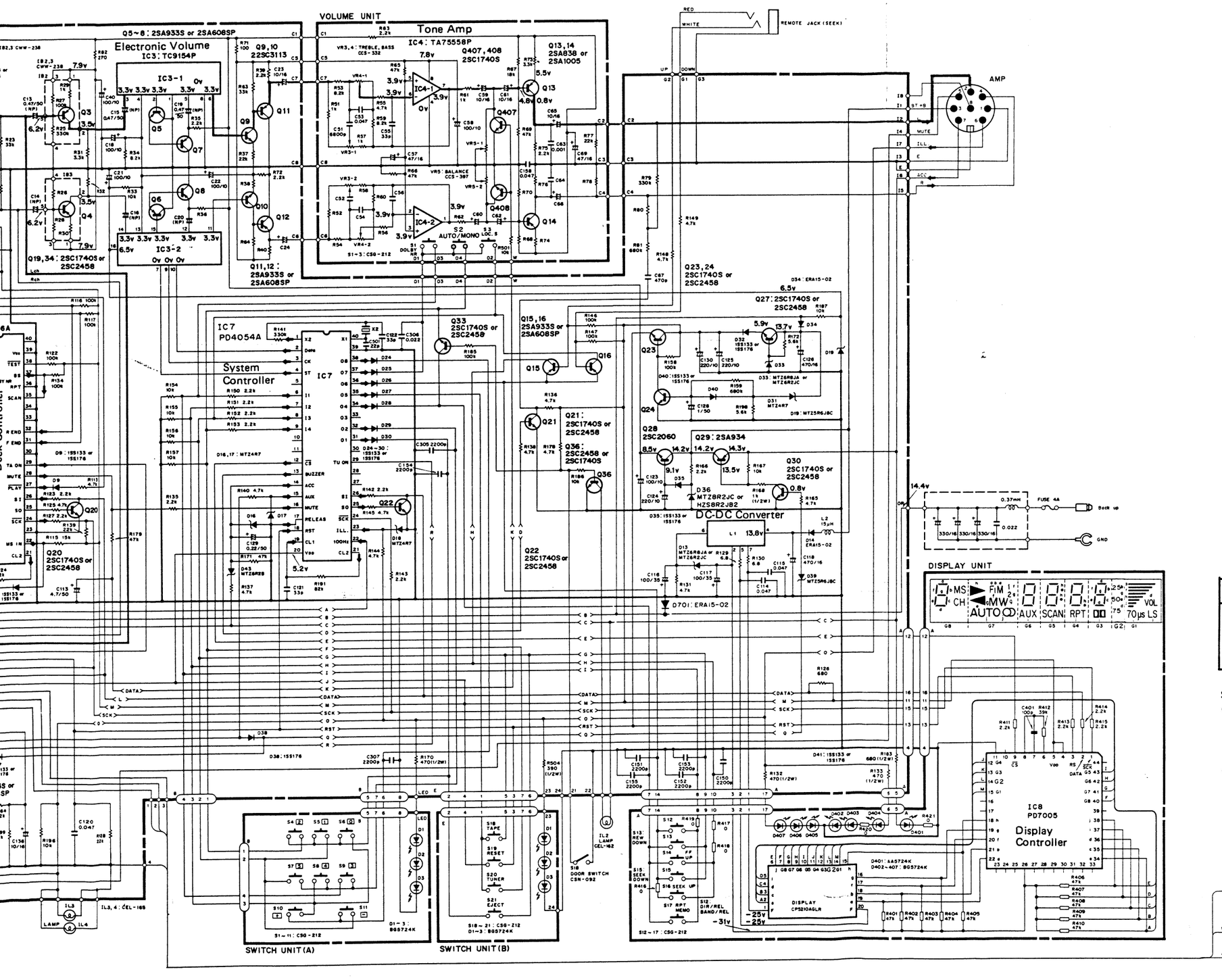
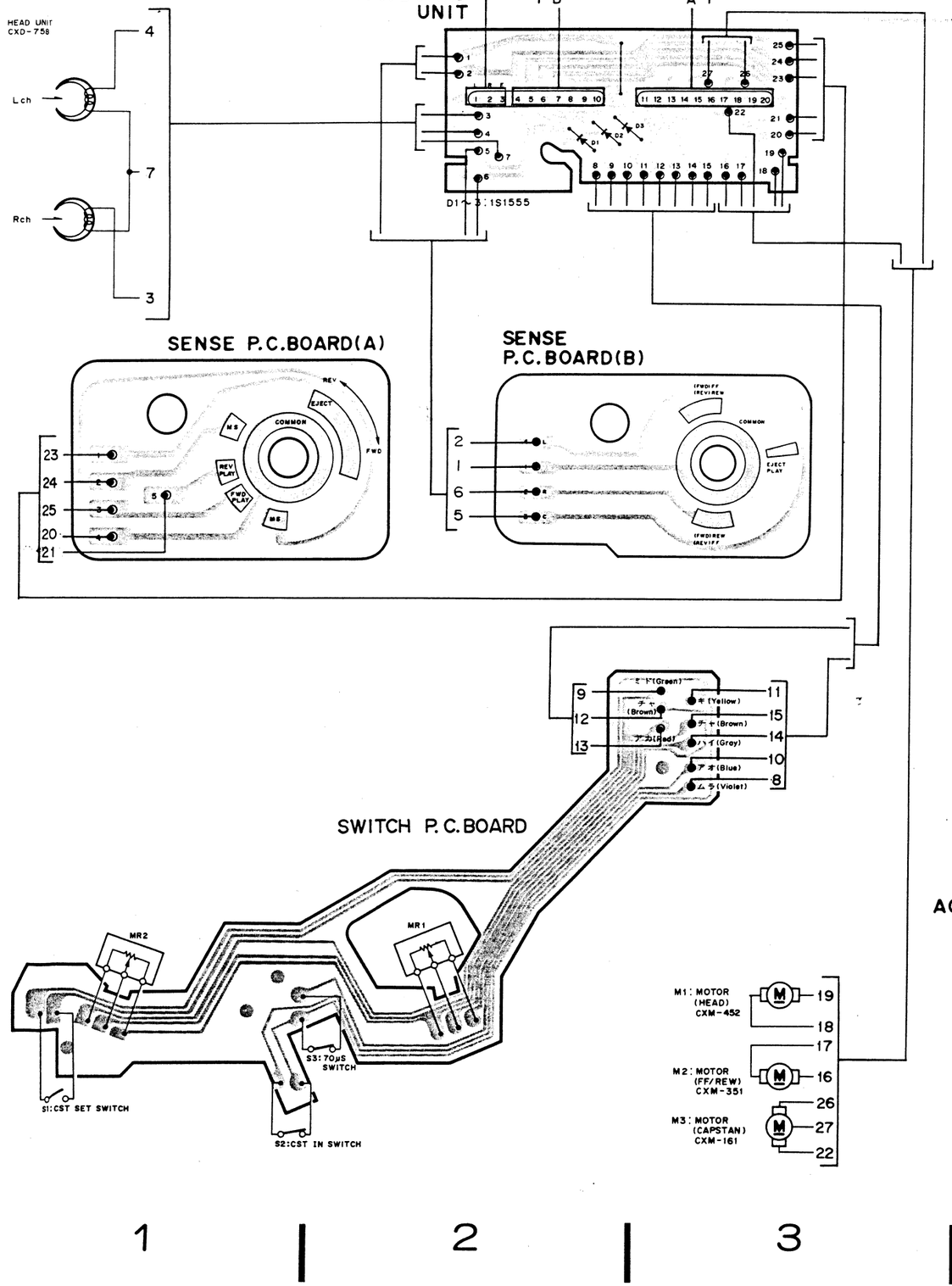

VOLUME UNIT
Tone Amp
IC4: TA75558P
Electronic Volume
IC3: TC9154P
Q5~8: 2SA933S or 2SA608SP
Q9,10 2SC3113
Q13,14 2SA838 or 2SA1005
Q407,408 2SC1740S
Q19,34: 2SC1740S or 2SC2458
Q11,12: 2SA933S or 2SA608SP
Q23,24 2SC1740S or 2SC2458
Q27: 2SC1740S or 2SC2458
Q15,16 2SA933S or 2SA608SP
Q33 2SC1740S or 2SC2458
Q21: 2SC1740S or 2SC2458
Q36: 2SC2458 or 2SC1740S
Q22 2SC1740S or 2SC2458
Q20 2SC1740S or 2SC2458
Q28 2SC2060
Q29: 2SA934
Q30 2SC1740S or 2SC2458
D36 MTZ6R2JC or HZS6R2JB2
DC-DC Converter
IC7 PD4054A
System Controller
IC8 PD7005
Display Controller
DISPLAY CPS210AGLR
DISPLAY UNIT
REMOTE JACK (SEEK)
AMP
RED
WHITE
SWITCH UNIT(A)
SWITCH UNIT(B)
S UNIT
S1 CST SET
S2 CST IN
S3 70μs
AUTO/MONO
S18 DOOR SW
S16 SEEK UP
S17 RPT MEMO
S12 DIR/REL BAND/REL
S13 REW DOWN
S14 FF UP
S15 SEEK DOWN
S18 TAPE
S19 RESET
S20 TUNER
S21 EJECT
D701: ERA15-02
D38: 1SS176
D40: 1SS133 or 1SS176
D41: 1SS133 or 1SS176
D39: MTZ5R6JBC
D43 MTZ6R2B
D34: ERA15-02
D33: MTZ6R8JA or MTZ6R2JC
D31 MTZ4R7
D19: MTZ5R6JBC
D13 MTZ6R8JA or MTZ6R2JC
D18 MTZ4R7
D16,17: MTZ4R7
D32 1SS133 or 1SS176
IL1,2 LAMP CEL-162
IL3,4: CEL-165
AUDIO CONTROL UNIT(CWX-574)
CONSISTS OF
◦MAIN UNIT
◦VOLUME UNIT
◦ACC SENSE UNIT
SWITCHES:
◎ SWITCH P.C.BOARD
S1: CST SET SWITCH ···· ON - OFF
S2: CST IN SWITCH ···· ON - OFF
S3: 70μs SWITCH ····· ON(120μs) - OFF(70μs)
◎ MISCELLANEOUS
S18: DOOR SWITCH ····· ON(CLOSE) - OFF(OPEN)
THE UNDERLINED INDICATED THE SWITCH POSITION.

Fig. 33

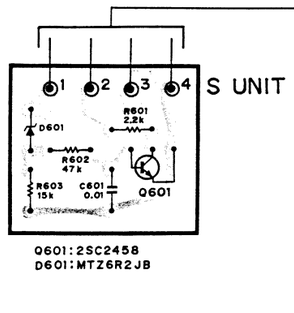
9. CONNECTION DIAGRAM (FX-K5/EW)

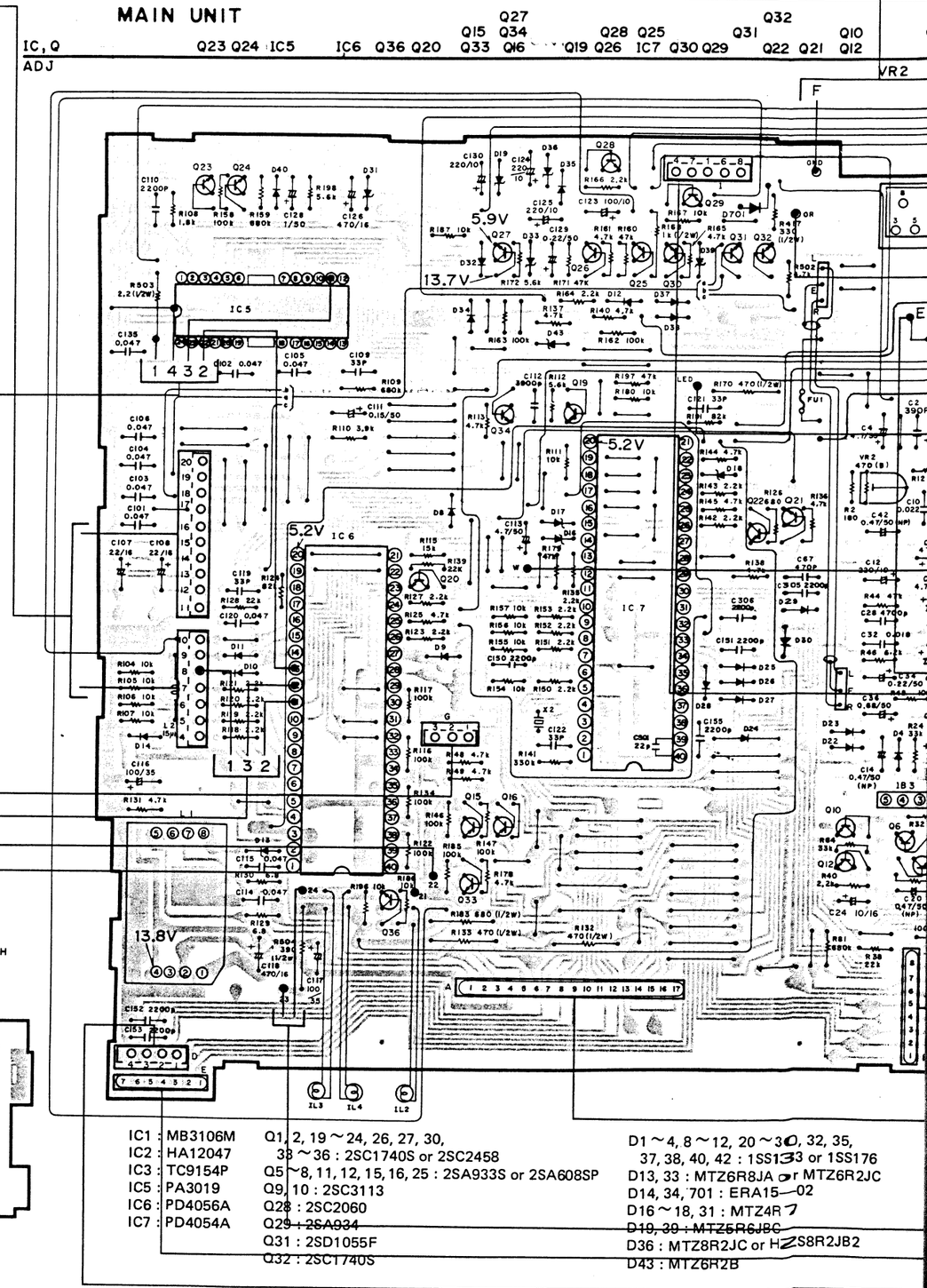


MAIN UNIT

	E	C	B
Q28	8.5	14.2	9.1
Q29	14.3	14.2	13.5
Q30			0.8

(V)





IC1 : MB3106M
IC2 : HA12047
IC3 : TC9154P
IC5 : PA3019
IC6 : PD4056A
IC7 : PD4054A

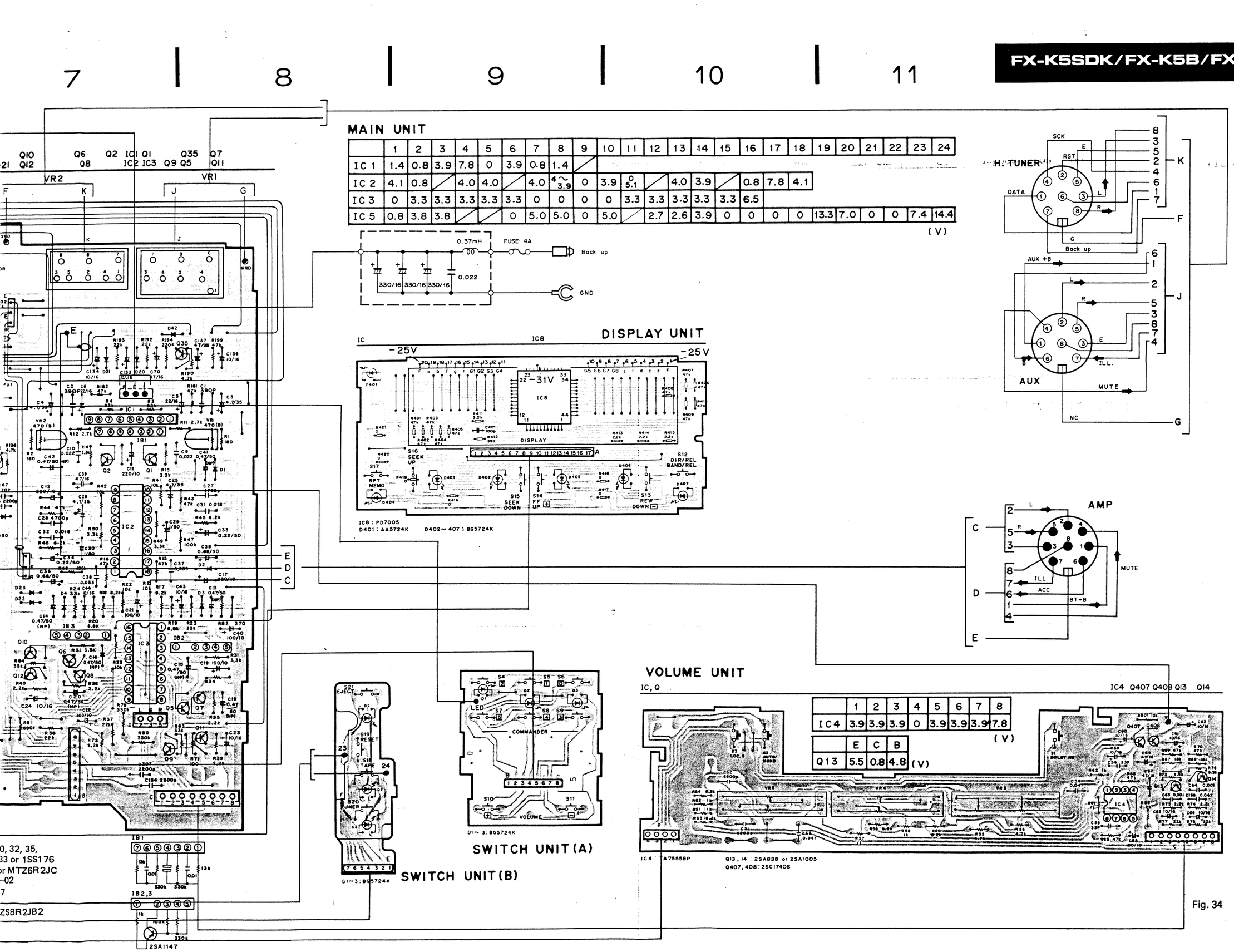
Q1, 2, 19～24, 26, 27, 30, 38～36 : 2SC1740S or 2SC2458
Q5～8, 11, 12, 15, 16, 25 : 2SA933S or 2SA608SP
Q9, 10 : 2SC3113
Q28 : 2SC2060
Q29 : 2SA934
Q31 : 2SD1055F
Q32 : 2SC1740S

D1～4, 8～12, 20～30, 32, 35, 37, 38, 40, 42 : 1SS133 or 1SS176
D13, 33 : MTZ6R8JA or MTZ6R2JC
D14, 34, 701 : ERA15-02
D16～18, 31 : MTZ4R7
D19, 39 : MTZ6R6JBC
D36 : MTZ8R2JC or HZS8R2JB2
D43 : MTZ6R2B

MAIN UNIT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
IC 1	1.4	0.8	3.9	7.8	0	3.9	0.8	1.4																
IC 2	4.1	0.8		4.0	4.0		4.0	4~3.9	0	3.9	0~5.1		4.0	3.9		0.8	7.8	4.1						
IC 3	0	3.3	3.3	3.3	3.3	3.3	0	0	0	0	3.3	3.3	3.3	3.3	3.3	6.5								
IC 5	0.8	3.8	3.8			0	5.0	5.0	0	5.0		2.7	2.6	3.9	0	0	0	0	13.3	7.0	0	0	7.4	14.4

(V)



	1	2	3	4	5	6	7	8
IC4	3.9	3.9	3.9	0	3.9	3.9	3.9	7.8

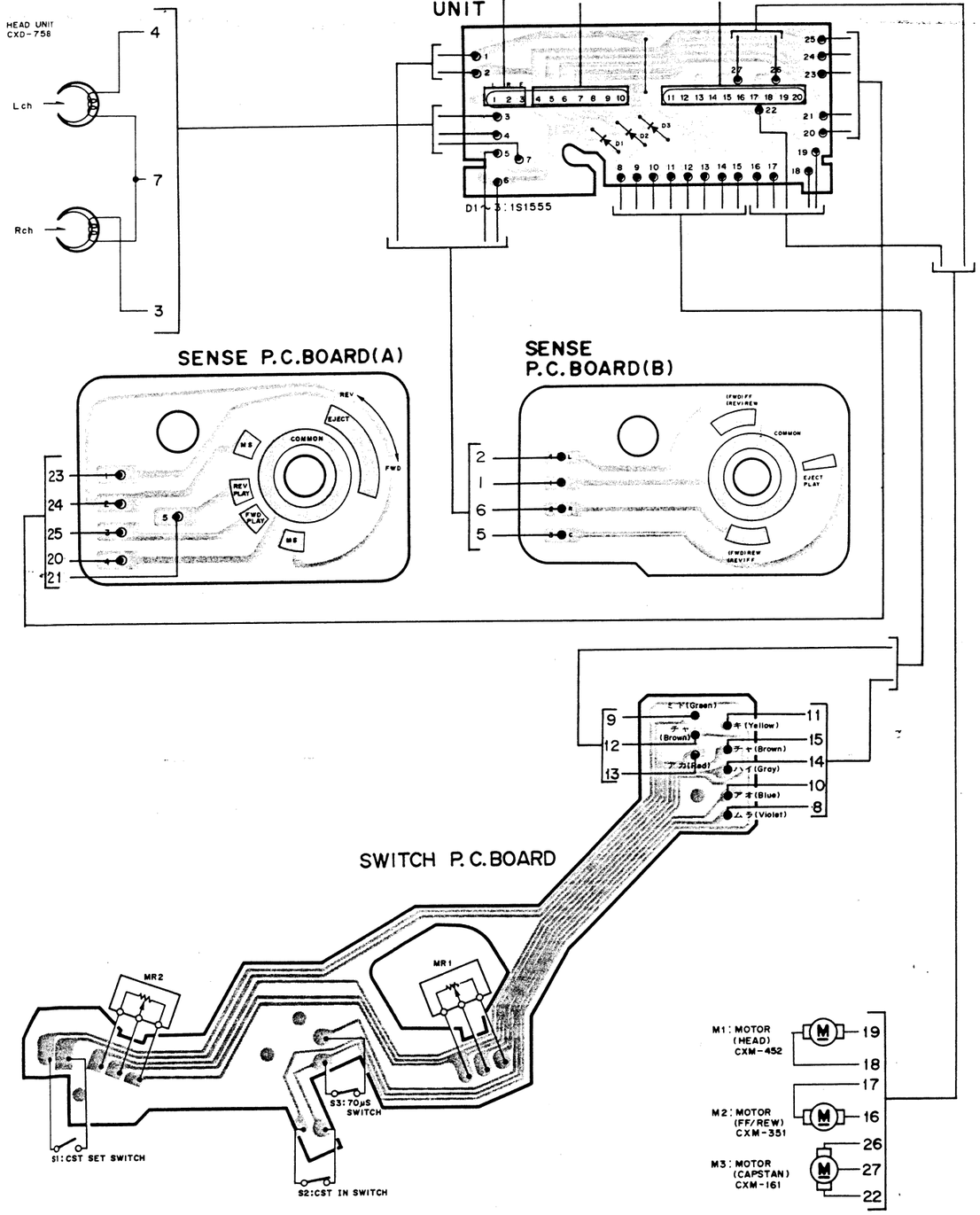
(V)

	E	C	B
Q13	5.5	0.8	4.8

(V)

Fig. 34

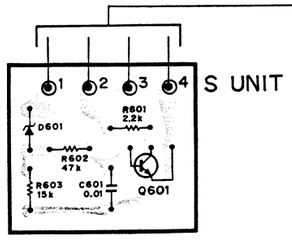
9. CONNECTION DIAGRAM (FX-K5/EW)

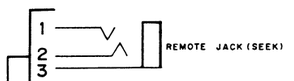


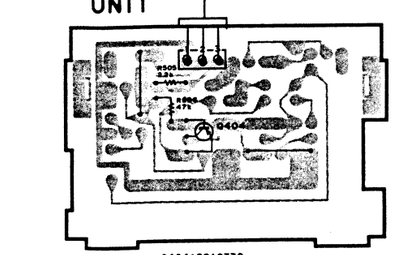
MAIN UNIT

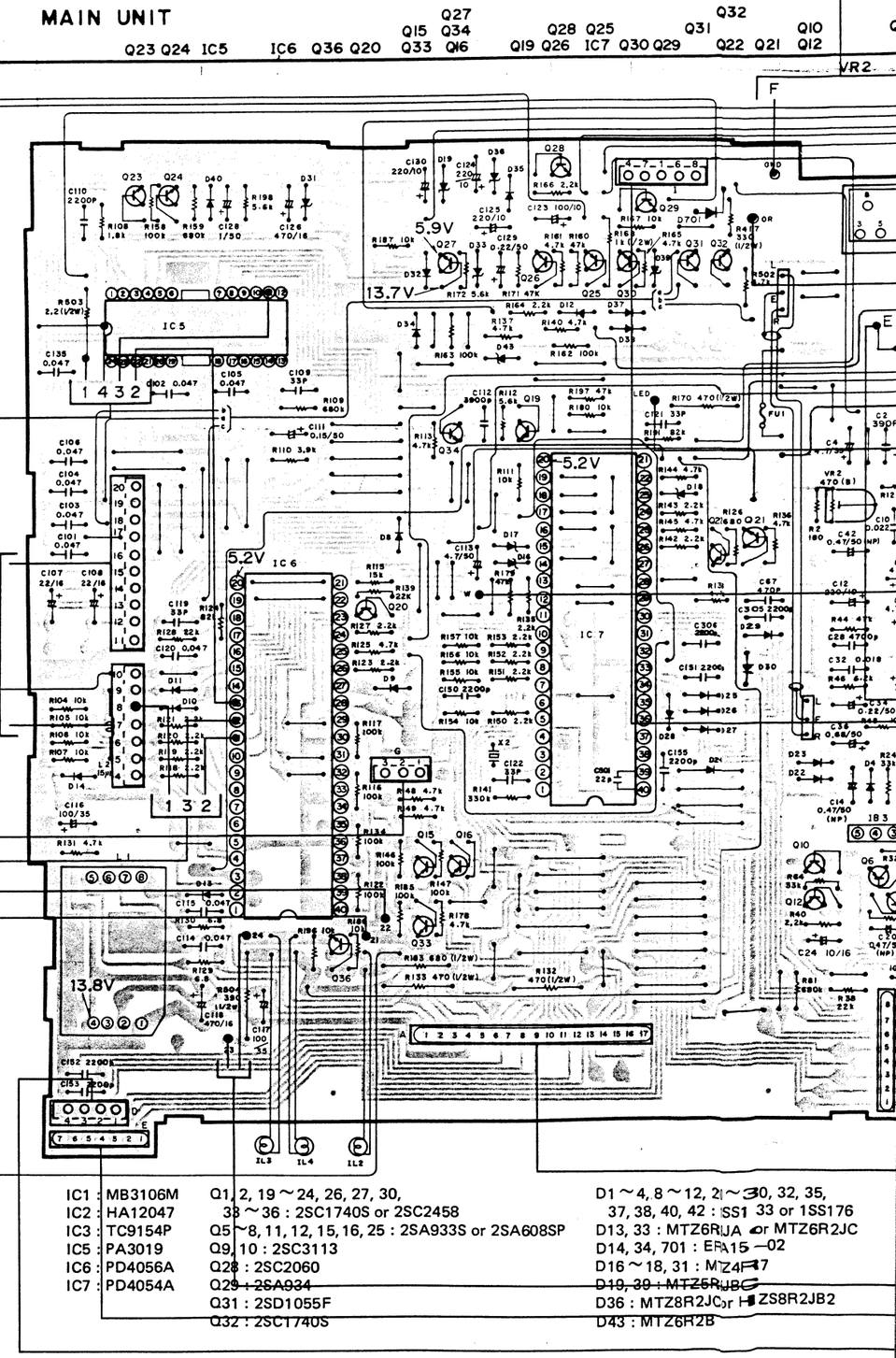
	E	C	B
Q28	8.5	14.2	9.1
Q29	14.3	14.2	13.5
Q30			0.8

(V)





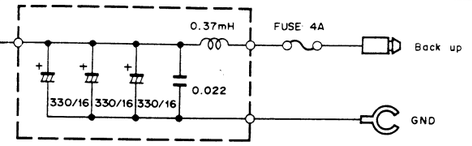




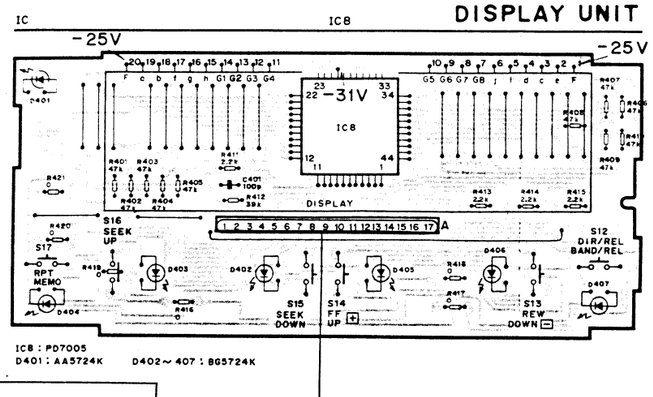
MAIN UNIT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
IC 1	1.4	0.8	3.9	7.8	0	3.9	0.8	1.4																
IC 2	4.1	0.8		4.0	4.0		4.0	4 ~ 3.9	0	3.9	5.1		4.0	3.9		0.8	7.8	4.1						
IC 3	0	3.3	3.3	3.3	3.3	3.3	0	0	0	0	3.3	3.3	3.3	3.3	3.3	6.5								
IC 5	0.8	3.8	3.8			0	5.0	5.0	0	5.0		2.7	2.6	3.9	0	0	0	0	13.3	7.0	0	0	7.4	14.4

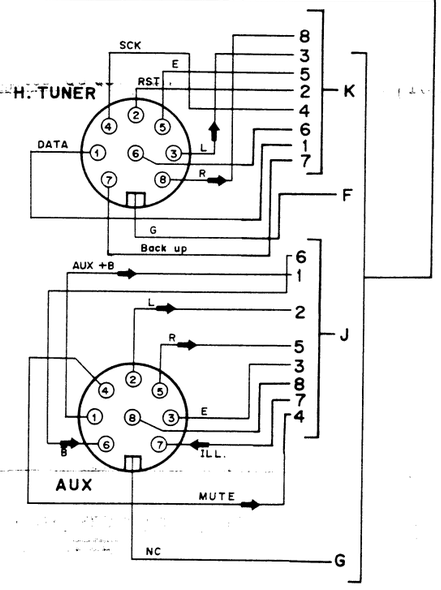
(V)

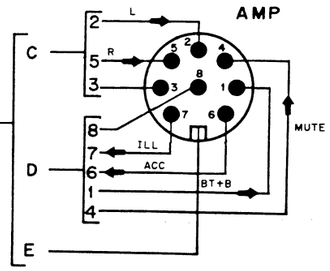


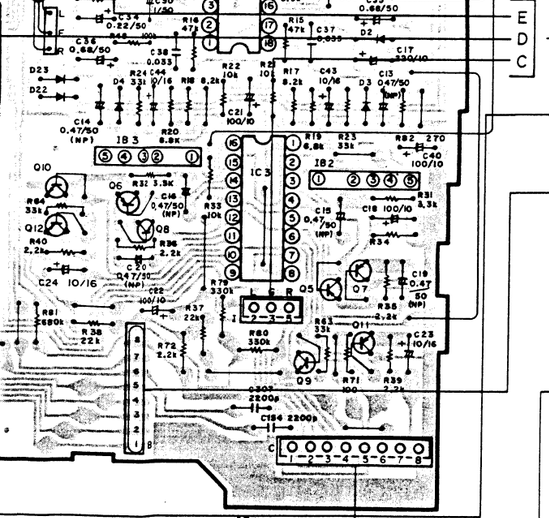
DISPLAY UNIT

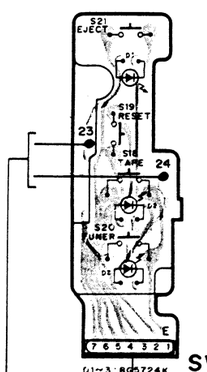


IC8 : PD7005
D401 : AA5724K D402~407 : BG5724K

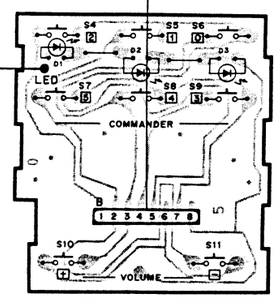








SWITCH UNIT (B)

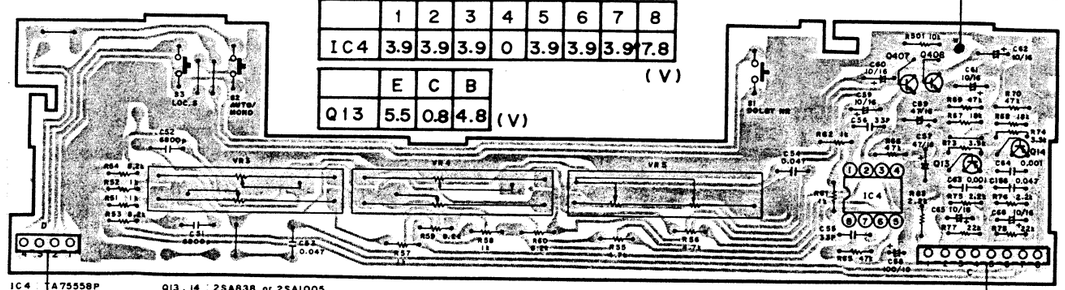


D1~3: BG5724K

SWITCH UNIT (A)

VOLUME UNIT

IC, Q



	1	2	3	4	5	6	7	8
IC4	3.9	3.9	3.9	0	3.9	3.9	3.9	7.8

(V)

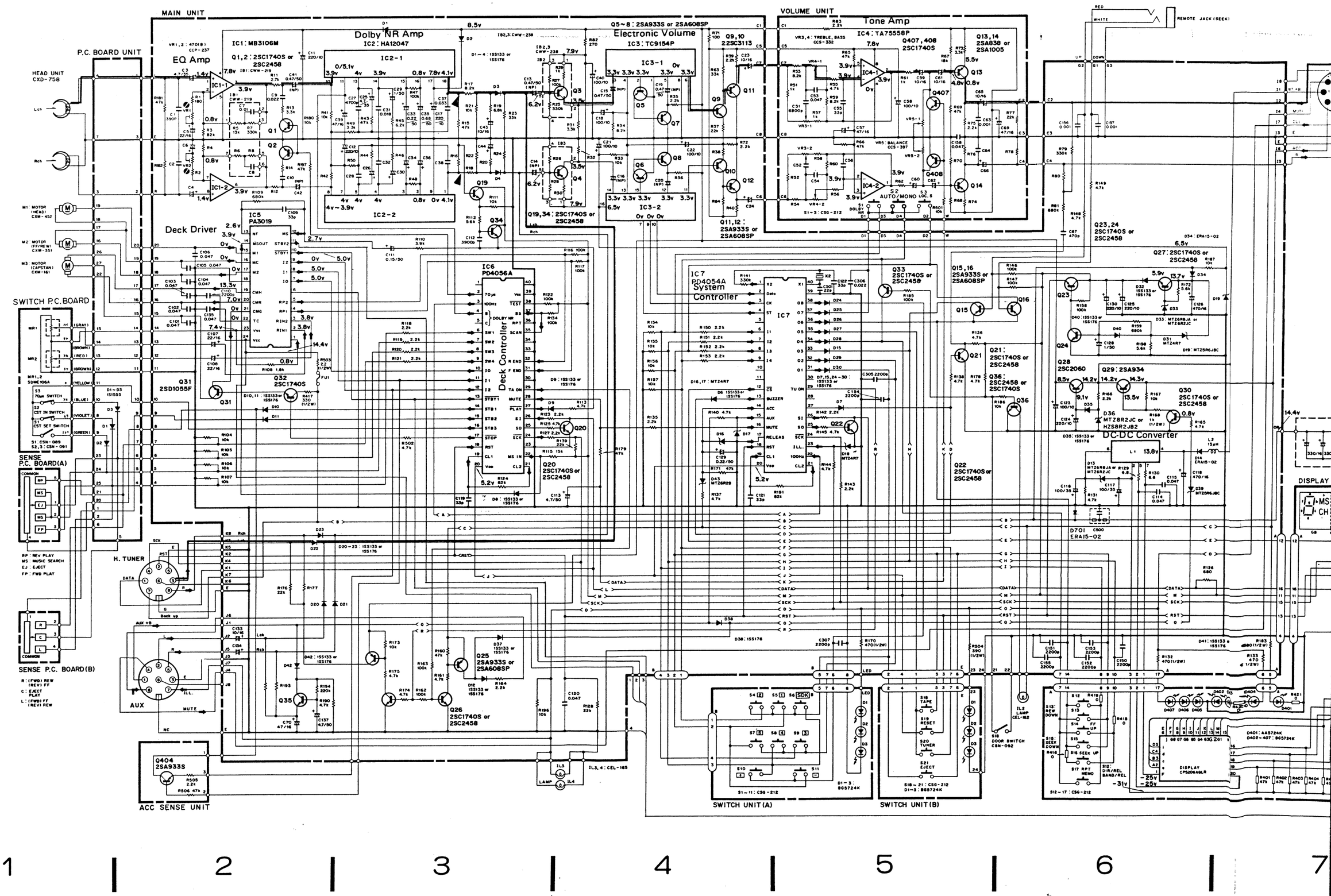
	E	C	B
Q13	5.5	0.8	4.8

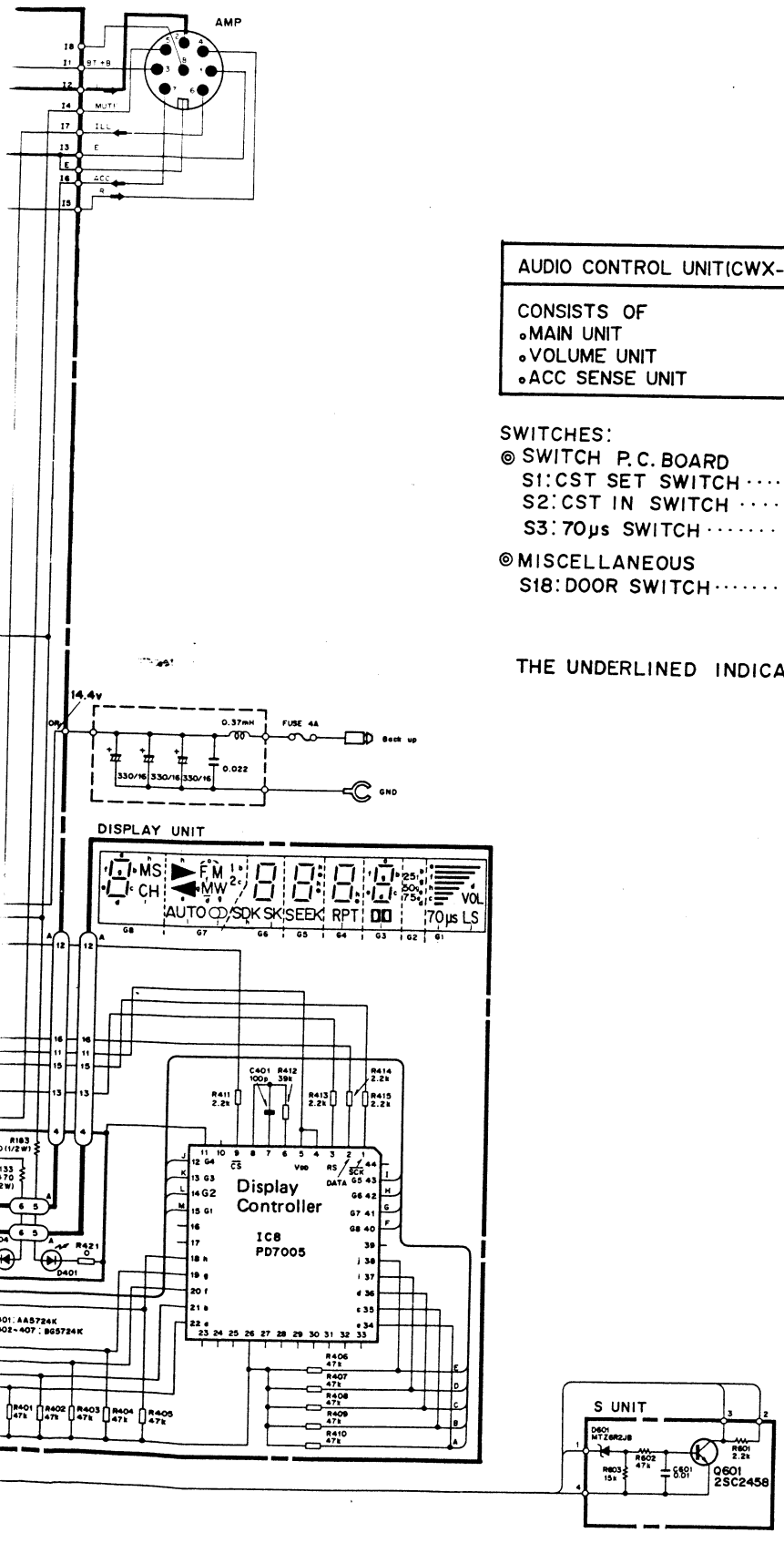
(V)

IC4 : TA7555BP
Q13, 14 : 2SA838 or 2SA1005
Q407, 408 : 2SC1740S

Fig. 34

11. SCHEMATIC CIRCUIT DIAGRAM (FX-K5SDK/WG)





AUDIO CONTROL UNIT(CWX-575)
CONSISTS OF •MAIN UNIT •VOLUME UNIT •ACC SENSE UNIT

SWITCHES:

◎ SWITCH P.C. BOARD

S1: CST SET SWITCH ···· ON – OFF

S2: CST IN SWITCH ···· ON – OFF

S3: 70µs SWITCH ····· ON(120µs) – OFF(70µs)

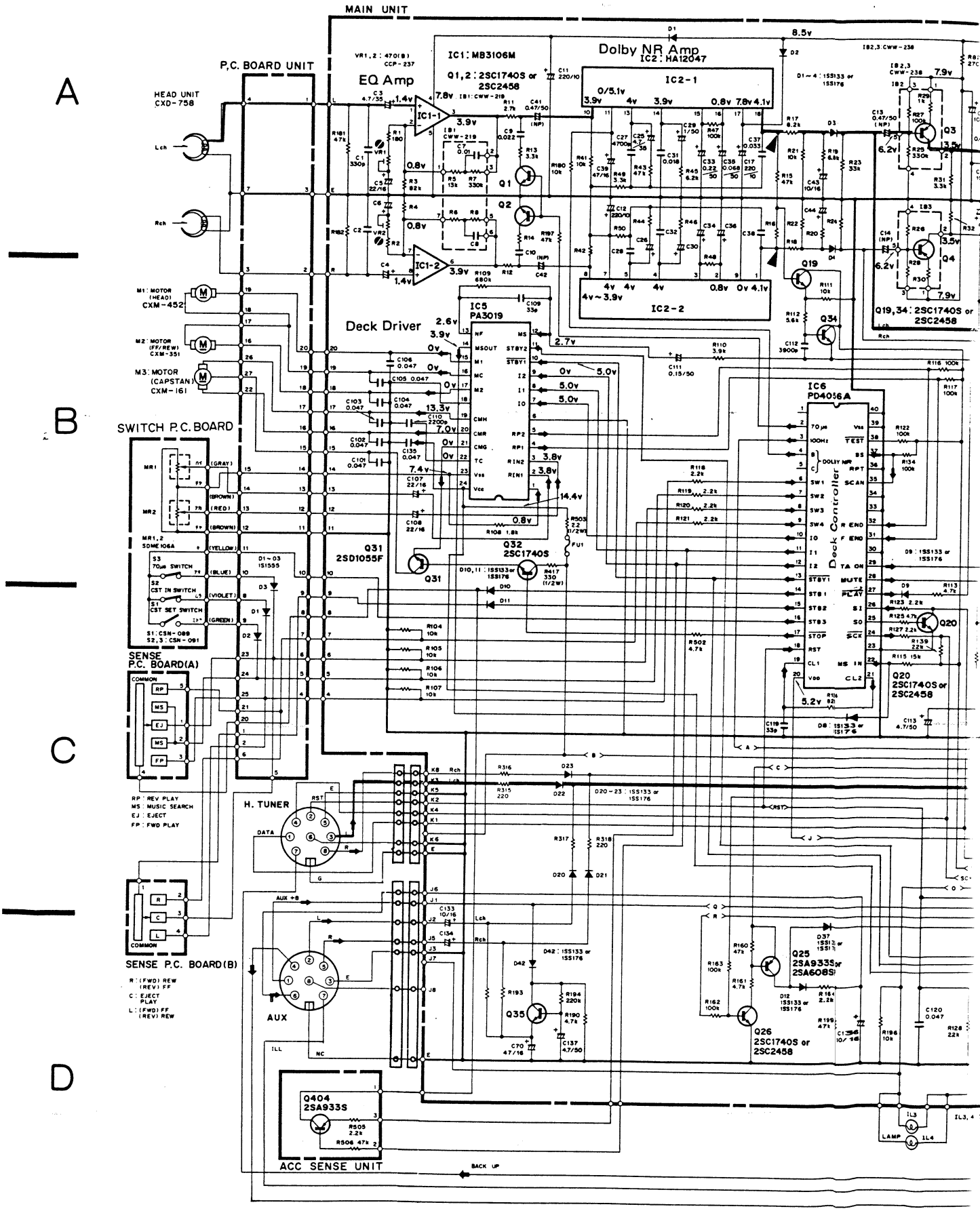
◎ MISCELLANEOUS

S18: DOOR SWITCH ····· ON(CLOSE) – OFF(OPEN)

THE UNDERLINED INDICATED THE SWITCH POSITION.

Fig. 36

12. SCHEMATIC CIRCUIT DIAGRAM (FX-K5B/EW)



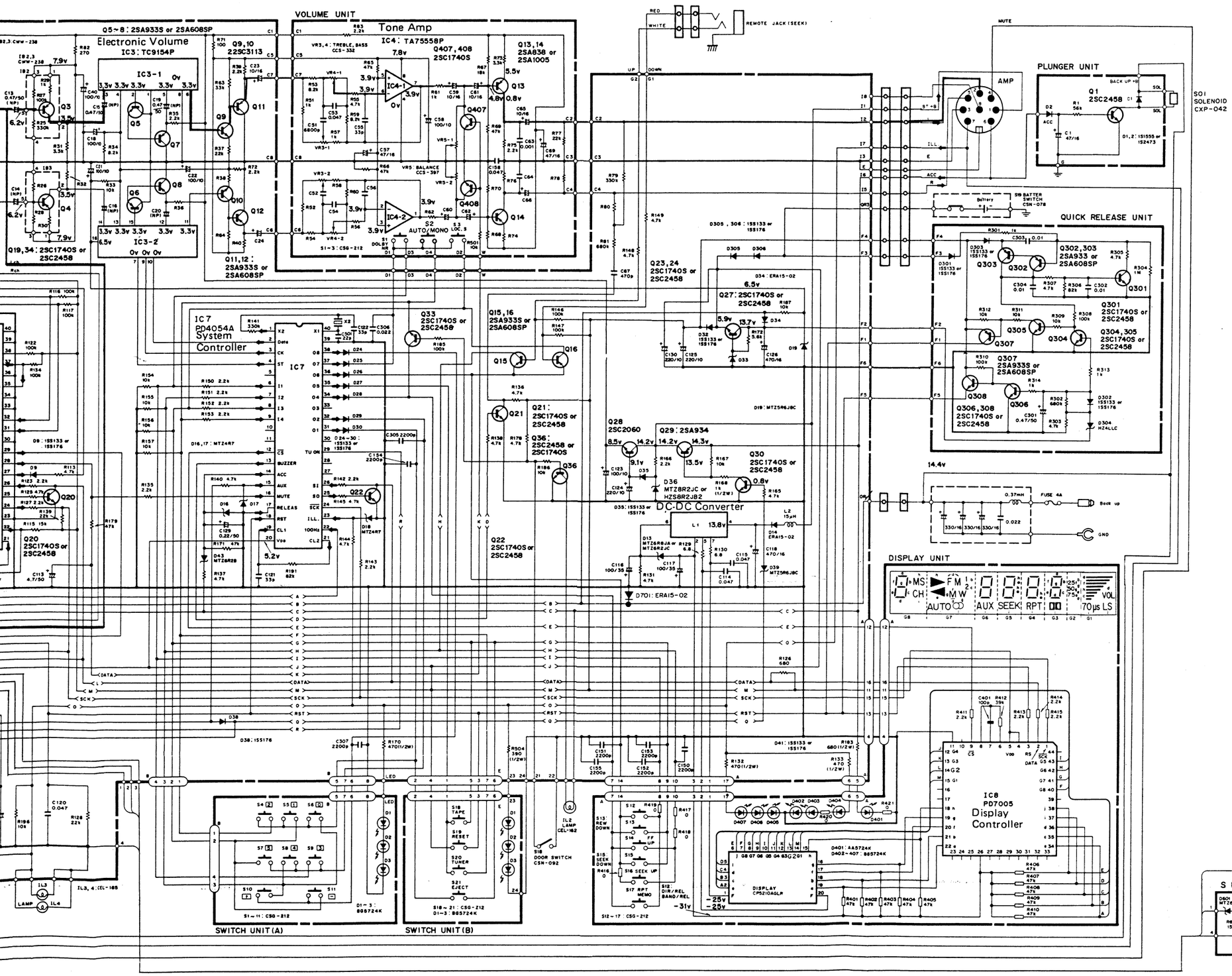
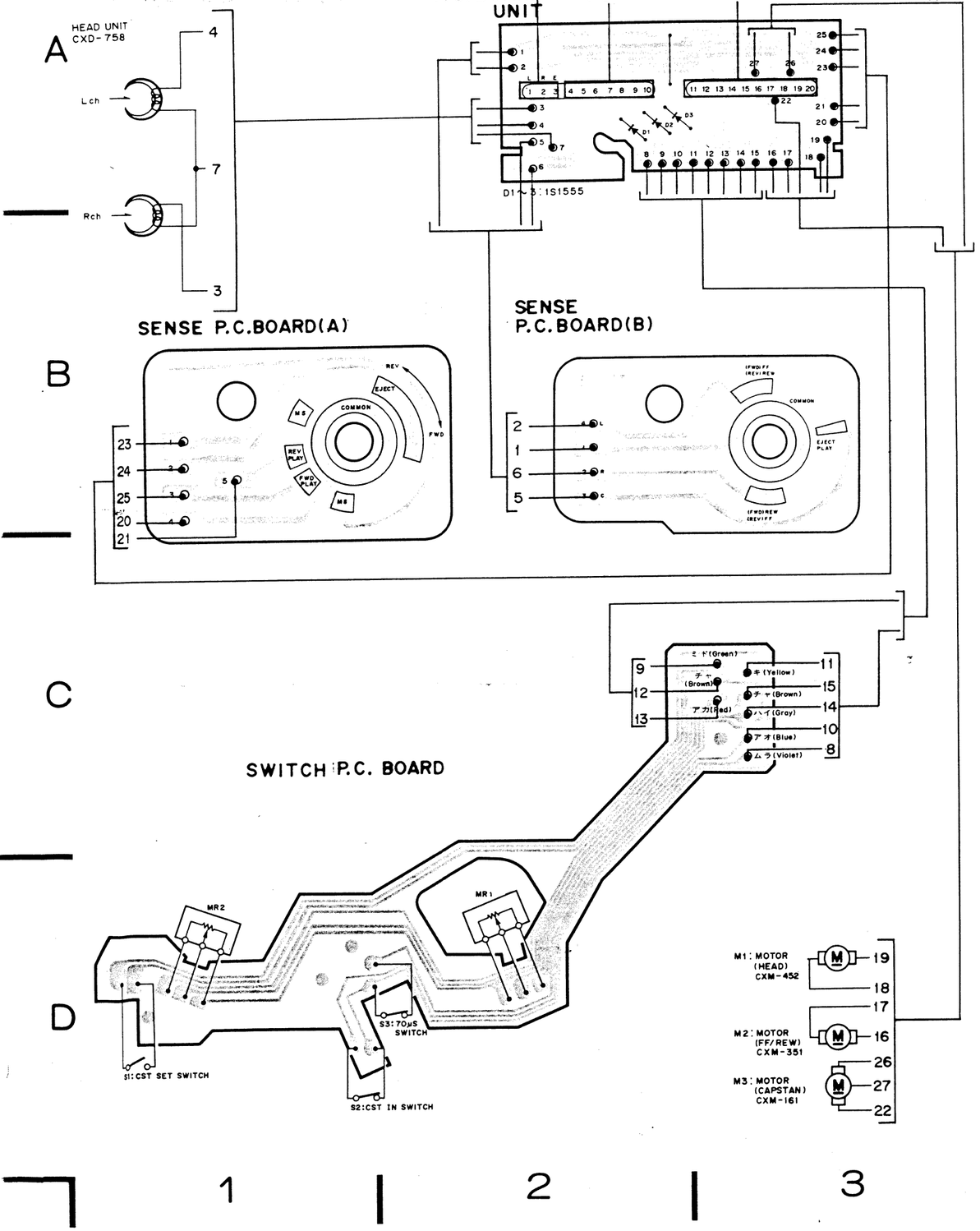

VOLUME UNIT
Tone Amp
IC4: TA75558P
Q407, 408 2SC1740S
Q13,14 2SA838 or 2SA1005
Electronic Volume
IC3: TC9154P
Q5~8: 2SA933S or 2SA608SP
Q9,10 2SC3113
IC3-1
IC3-2
Q19,34: 2SC1740S or 2SC2458
Q11,12: 2SA933S or 2SA608SP
IC4-1
IC4-2
AUTO/MONO
VR3,4: TREBLE, BASS CCS-332
VR5 BALANCE CCS-397
S1-3: CSG-212
REMOTE JACK (SEEK)
RED
WHITE
MUTE
AMP
PLUNGER UNIT
Q1 2SC2458
SOL SOLENOID CXP-042
QUICK RELEASE UNIT
Q302,303 2SA933 or 2SA608SP
Q301 2SC1740S or 2SC2458
Q304,305 2SC1740S or 2SC2458
Q306,308 2SC1740S or 2SC2458
Q307 2SA933S or 2SA608SP
SW BATTERY SWITCH CSN-078
Battery
IC7 PD4054A System Controller
Q33 2SC1740S or 2SC2458
Q15,16 2SA933S or 2SA608SP
Q21: 2SC1740S or 2SC2458
Q36: 2SC2458 or 2SC1740S
Q22 2SC1740S or 2SC2458
Q23,24 2SC1740S or 2SC2458
Q27: 2SC1740S or 2SC2458
Q28 2SC2060
Q29: 2SA934
Q30 2SC1740S or 2SC2458
D36 MTZ8R2JC or HZS8R2JB2
DC-DC Converter
D34: ERA15-02
D19: MTZ5R6JBC
D701: ERA15-02
IC8 PD7005 Display Controller
DISPLAY UNIT
DISPLAY CPS210AGLR
D401: AA5724K
D402~407: 865724K
SWITCH UNIT (A)
SWITCH UNIT (B)
S16 TAPE
S19 RESET
S20 TUNER
S21 EJECT
S18 DOOR SWITCH CSN-092
S UNIT
Q601 2SC2458
D601 MTZ6R2JB
AUDIO CONTROL UNIT(CWX-576)
CONSISTS OF
•MAIN UNIT
•VOLUME UNIT
•ACC SENSE UNIT
•QUICK RELEASE UNIT
SWITCHES:
◎ SWITCH P.C.BOARD
S1: CST SET SWITCH ···· ON – OFF
S2: CST IN SWITCH ···· ON – OFF
S3: 70μs SWITCH ····· ON(120μs) – OFF(70μs)
◎ MISCELLANEOUS
S18: DOOR SWITCH ····· ON(CLOSE) – OFF(OPEN)
S19: BATTERY SWITCH..... ON – OFF
THE UNDERLINED INDICATED THE SWITCH POSITION.

Fig.37

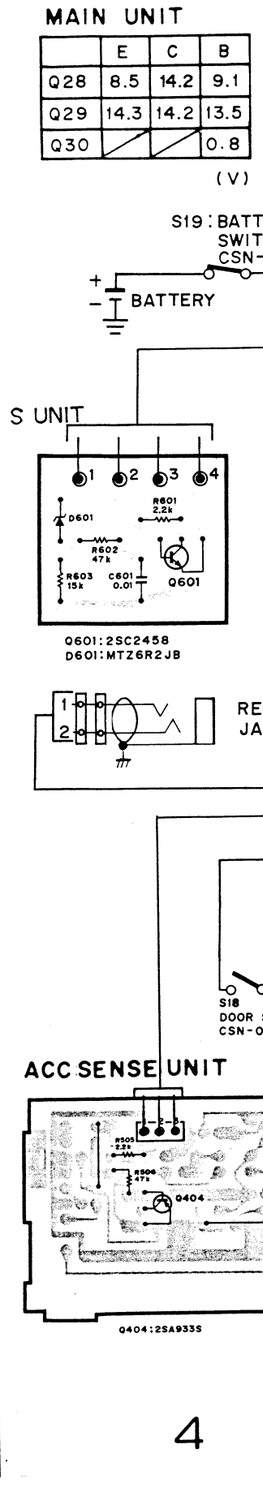
13. CONNECTION DIAGRAM (FX-K5B/EW)

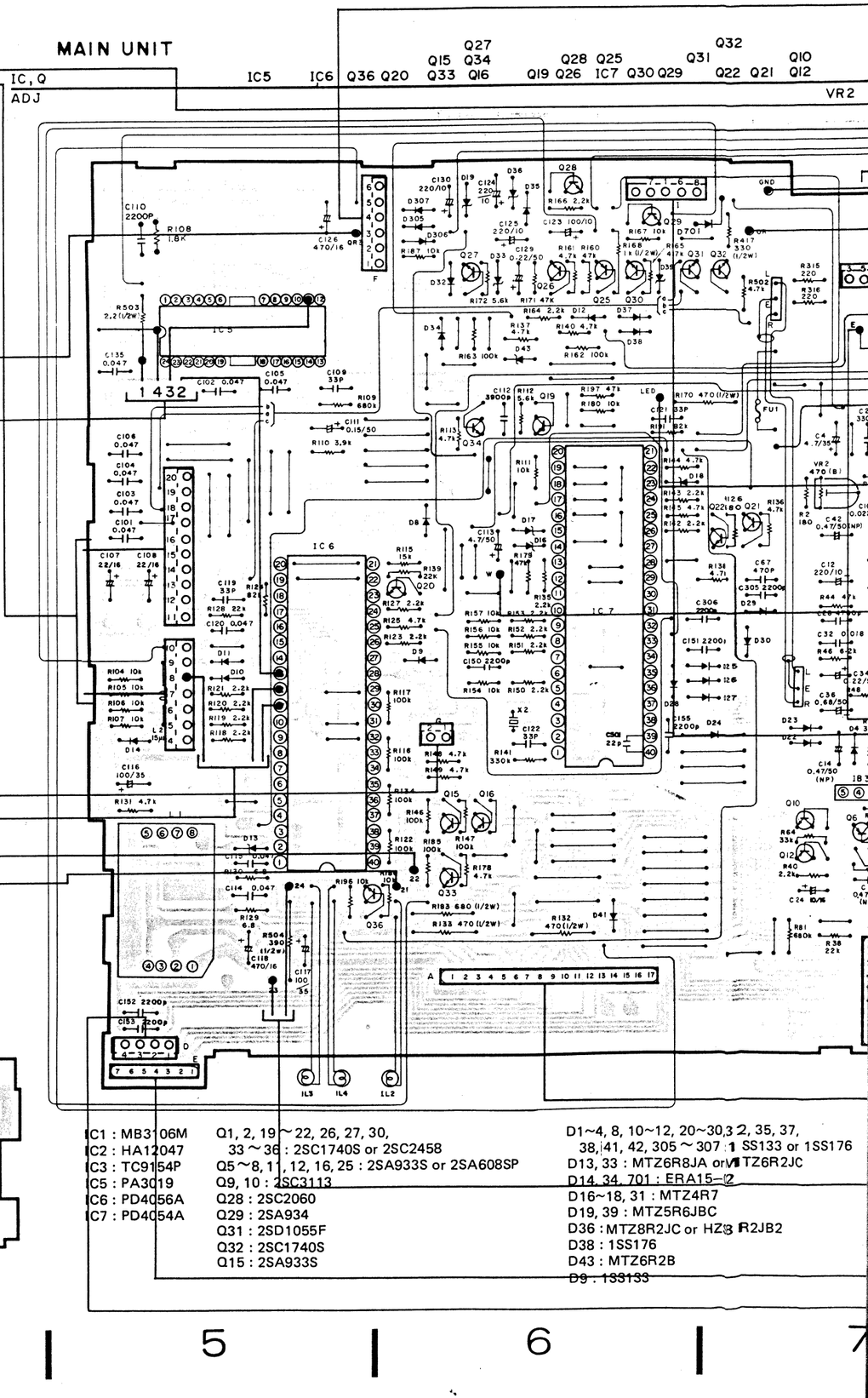


MAIN UNIT

	E	C	B
Q28	8.5	14.2	9.1
Q29	14.3	14.2	13.5
Q30			0.8

(V)





7 | 8 | 9 | 10 | 11

MAIN UNIT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
IC 1	1.4	0.8	3.9	7.8	0	3.9	0.8	1.4																
IC 2	4.1	0.8		4.0	4.0		4.0	4~3.9	0	3.9	0~5.1		4.0	3.9		0.8	7.8	4.1						
IC 3	0	3.3	3.3	3.3	3.3	3.3	0	0	0	0	3.3	3.3	3.3	3.3	3.3	6.5								
IC 5	0.8	3.8	3.8			0	5.0	5.0	0	5.0		2.7	2.6	3.9	0	0	0	0	13.3	7.0	0	0	7.4	14.4

(V)

QUICK RELEASE UNIT

DISPLAY UNIT

IC8 : PD7005
D401 : AA5724K D402~407 : BG5724K

Q301, Q302, Q303, Q308, Q307, Q305, Q306, Q304

Q301,304~306,308 : 2SC1740S or 2SC2458
Q302,303,307 : 2SA933S or 2SA608SP
D301~303,305 : 1SS133 or 1SS176
D304 : HZ4LLC

H. TUNER / AUX

PLUNGER UNIT

Q1 : 2SC2458
D1,2 : 1S2473VH, 1S1555 or 1SS1040

SOLENOID CXP-042

AMP

VOLUME UNIT

IC, Q

IC4 Q407 Q408 Q13 Q14

	1	2	3	4	5	6	7	8
IC4	3.9	3.9	3.9	0	3.9	3.9	3.9	7.8

(V)

	E	C	B
Q13	5.5	0.8	4.8

(V)

IC4 : TA75558P
Q13, 14 : 2SA838 or 2SA1005
Q407, 408 : 2SC1740S

SWITCH UNIT (A)

D1~3 : BG5724K

SWITCH UNIT (B)

D1~3 : BG5724K

Fig. 38

7 | 8 | 9 | 10 | 11 | 12

14. CHASSIS (1) EXPLODED VIEW (FX-K5/EW, FX-K5 SDK/WG)

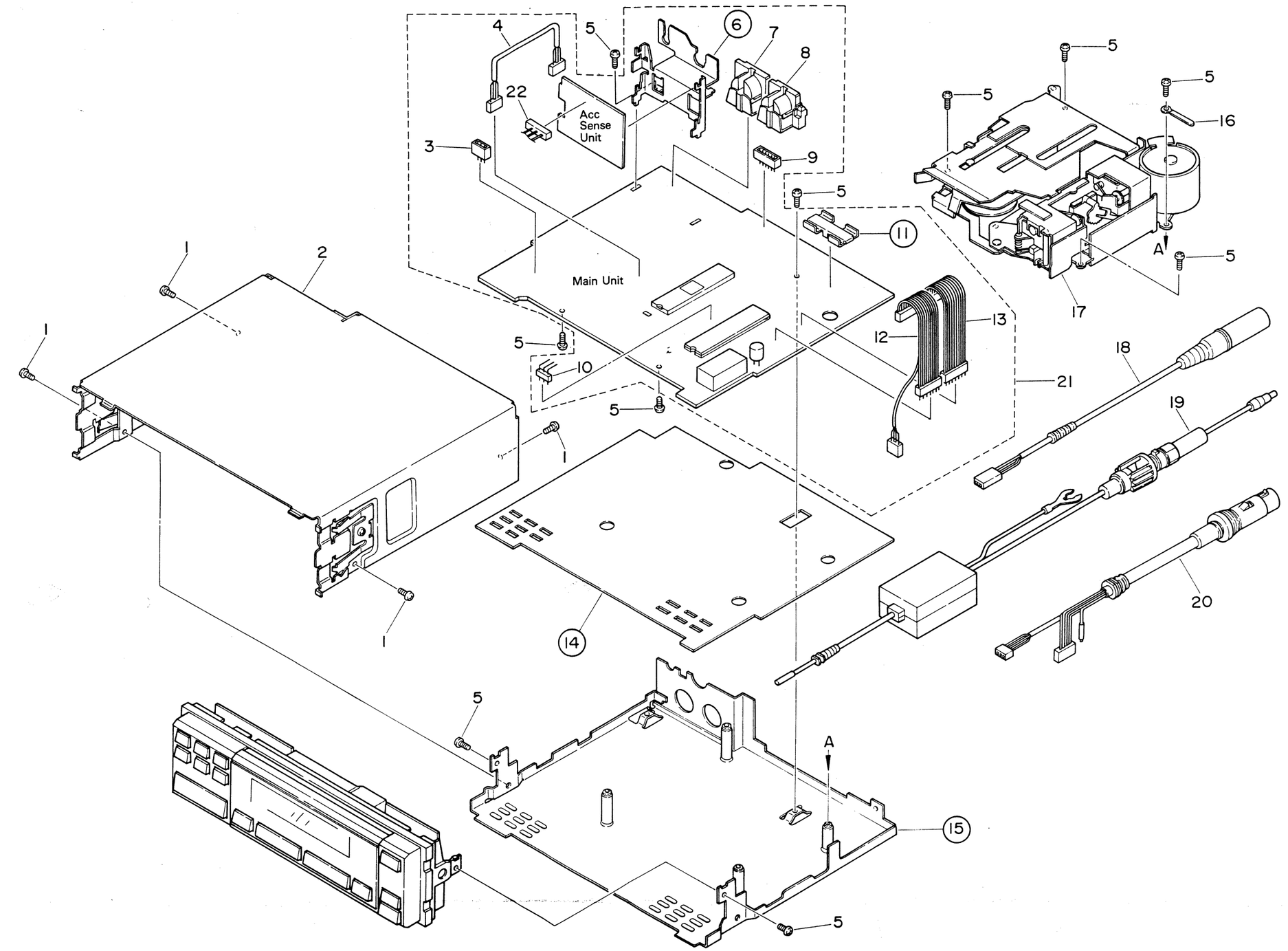


Fig. 39

- **Chassis (1) (FX-K5/EW, FX-K5 SDK/WG)**
- **Parts List**

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Mark	No.	Part No.	Description
	1.	CBA-121	Screw
	2.	CXD-637	Case Unit
	3.	CKS-567	Plug
	4.	CDF-657	Connector
	5.	BMZ 26P050FMC	Screw
	6.		Holder
	7.	CKS-549	Connector
	8.	CKS-550	Connector
	9.	CKS-569	Plug
	10.	CKS-207	Plug
	11.		Heat Sink
	12.	CDF-994	Connector
	13.	CDF-995	Connector
	14.		Insulator
	15.		Chassis Unit
	16.	CEF-007	Clamper
	17.	CXK-600	Cassette Mechanism Assy
	18.	CDK-113	Cord
	19.	CDK-099	Cord
	20.	CDK-112	DIN Connector Cord
	21.	CWX-574	Audio Control Unit (1/2) (/EW)
		CWX-575	Audio Control Unit (1/2) (SDK/WG)
	22.	CDK-274	Connector

15.CHASSIS (2) EXPLODED VIEW (FX-K5/EW, FX-K5 SDK/WG)

- **Parts List**

Mark	No.	Part No.	Description
	1.	CBH-792	Spring
	2.	CMZ30P050FMC	Screw
	3.	CNW-978	Plate
	4.	CNW-976	Plate
	5.	BMZ26P040FMC	Screw
	6.	CWS-220	Dispaly Unit (/EW)
		CWS-221	Display Unit (SDK/WG)
	7.	CNN-369	Film
★	8.	CAC-826	Button (DIR, BAND/REL)
	9.	CNN-289	Spacer
	10.	CNN-170	Cushion
★	11.	CAC-825	Button
★	12.	CAC-827	Button (RPT, MEMO)
	13.	CXD-538	Grille Unit
	14.	CNK-281	Grille
	15.	CNW-979	Plate
	16.	CP5210AGLR	FL Tube (/EW)
		CP5206AGLR	FL Tube (SDK/WG)
	17.	CNN-341	Cushion
	18.	CBA-172	Screw
★★	19.	CSN-092	Switch (Door)
	20.	BPZ20P040FMC	Screw
	21.		Holder
	22.	CNN-171	Cushion
★	23.	CAC-829	Button (DOLBY NR)
	24.	CNN-290	Cushion
★	25.	CAC-829	Button (AUTO/MONO, LOC. S)
★	26.	BG5724K	LED
★★	27.	CSG-212	Switch
★	28.	AA5724K	LED
	29.	CNL-622	P.C.Board
	30.	CAC-772	Button (0) (/EW)
		CAC-798	Button (SDK) (SDK/WG)
★	31.	CAC-775	Button (3)
★	32.	CAC-776	Button (4)
★	33.	CAC-773	Button (1)
★	34.	CAC-774	Button (2)
★	35.	CAC-777	Button (5)
★	36.	CAC-824	Button (VOLUME)
	37.	CNN-168	Cushion
	38.	CNW-824	Lens
	39.	BPZ20P040FMC	Screw
	40.		Holder
	41.	YE30FUC	Washer
	42.	CBH-793	Spring
	43.		Lever
	44.		Holder
	45.	CXD-519	Bearing Unit
	46.	CNL-921	P.C. Board
	47.	BPZ20P080FMC	Screw
	48.	CNY-142	Spacer
★	49.	CAC-577	Button (EJECT)
★	50.	CAC-609	Button (Tape)
★	51.	CAC-615	Button (Clear)
★	52.	CAC-608	Button (Tuner)
	53.	CNN-169	Cushion
	54.	CXD-435	Grille Assy (/EW)
		CXD-436	Grille Assy (SDK/WG)
	55.	PTZ20P080FNi	Screw
	56.	CNW-818	Holder (/EW)
		CNY-022	Holder (SDK/WG)
	57.	CAT-220	Door
	58.	CBH-888	Spring
	59.		P.C. Board
	60.	CNL-819	P.C. Board
★★	61.	CEL-165	Lamp
	62.	HBF-120	Washer
	63.	BMZ20P030FBK	Screw
★	64.	CAC-970	Knob
	65.	CWX-574	Audio Control Unit (2/2) (/EW)
		CWX-575	Audio Control Unit (2/2) (SDK/WG)
	66.	CKS-212	Plug
★★	67.	CEL-162	Lamp
★★	68.	CSG-212	Switch
★★	69.	CCS-397	Volume (BALANCE)
★★	70.	CCS-332	Volume (BASS, TREBLE)
	71.	CKS-208	Plug
	72.		Frame
	73.	CNM-930	Cover

• Chassis (2) (FX-K5/EW, FX-K5 SDK/WG)

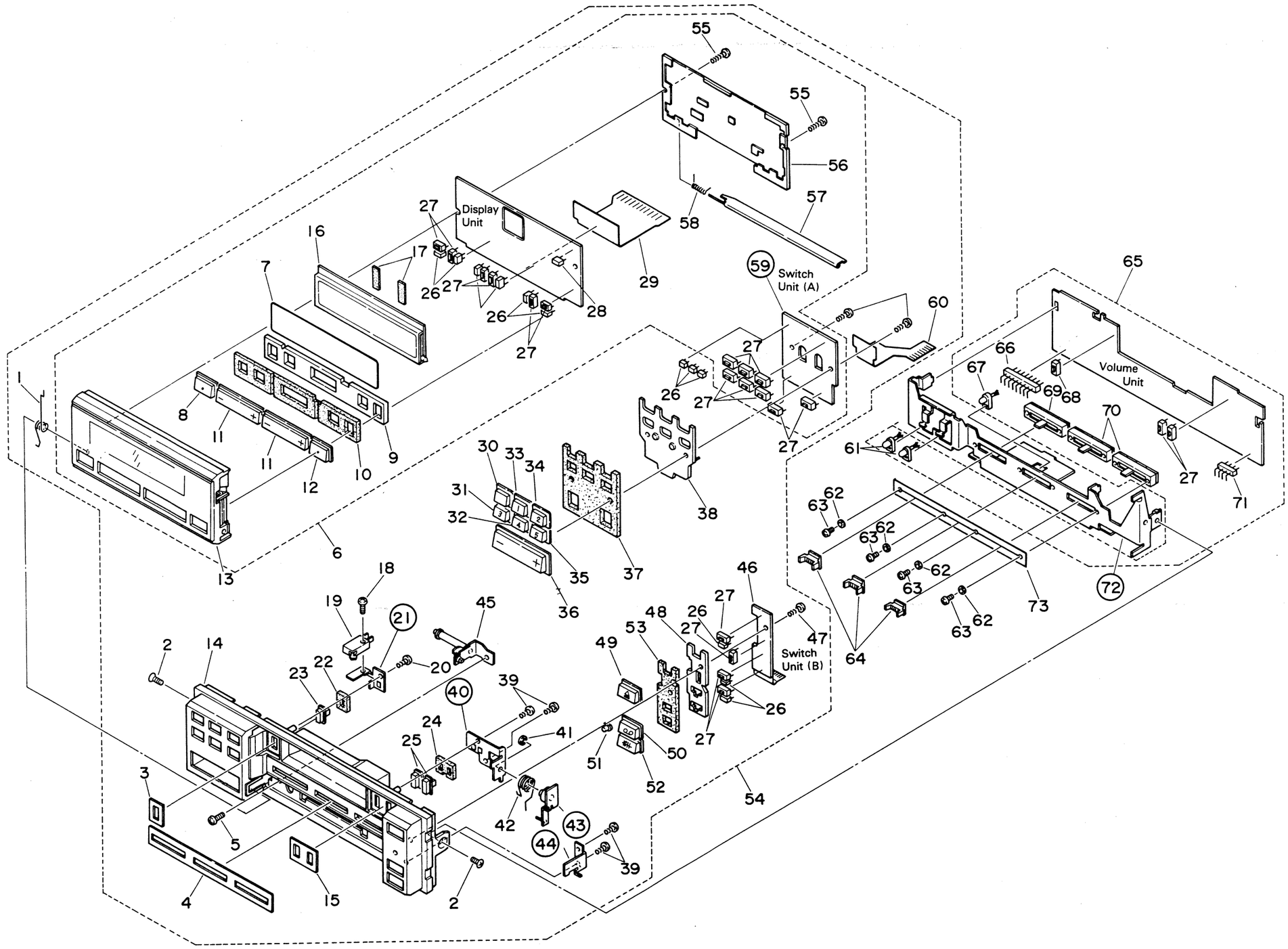


Fig. 40

16.CHASSIS (1) EXPLODED VIEW (FX-K5B/EW)

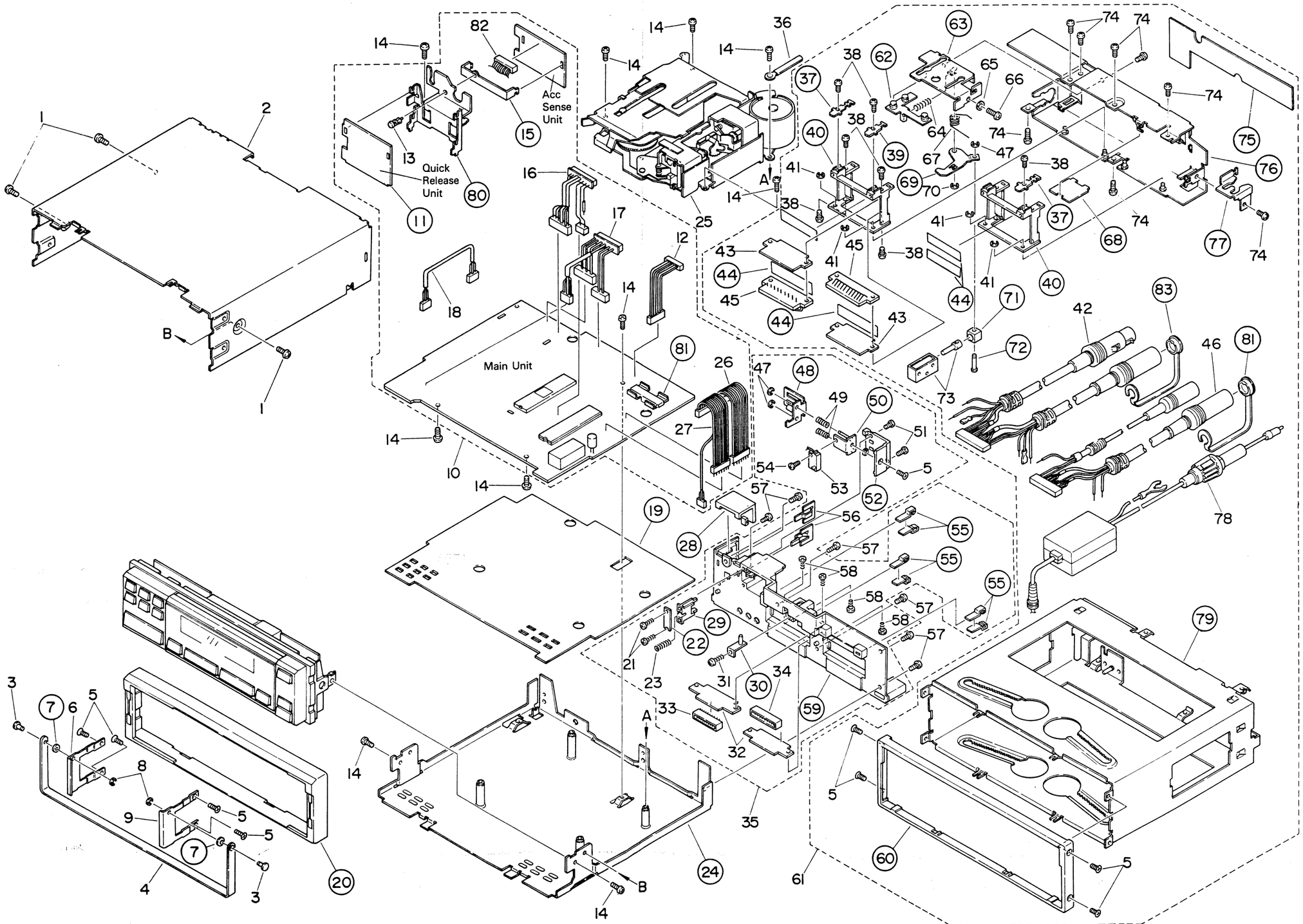


Fig. 41

• Chassis (1) (FX-K5B/EW)

• Parts List

Mark	No.	Part No.	Description
	1.	BMZ30P050FNZ	Screw
	2.	CNB-864	Case
	3.	CLB-553	Pin
	4.	CNG-471	Handle
	5.	CMZ26P040FZK	Screw
	6.	CNG-472	Holder
	7.		Spring
	8.	YE20FUC	Washer
	9.	CNG-476	Holder
	10.	CWX-576	Audio Control Unit (1/2)
	11.		Quick Release Unit
	12.	CDK-028	Connector
	13.	CBM-023	Rivet
	14.	BMZ26P050FMC	Screw
	15.		Holder
	16.	CDK-298	Connector
	17.	CDK-075	Connector
	18.	CDF-657	Connector
	19.		Insulator
	20.		Spacer
	21.	HBA-355	Screw
	22.		Holder
	23.	CBH-782	Spring
	24.		Chassis Unit
	25.	CXK-600	Cassette Mechanism Assy
	26.	CDF-995	Connector
	27.	CDF-994	Connector
	28.		Cover
	29.		Stopper
	30.		Stopper
	31.	BTZ26P060FMC	Screw
	32.	CNL-529	P.C. Board
	33.	CKS-476	Plug
	34.	CKS-547	Plug (Red)
	35.	CXD-521	Rear Panel Assy
	36.	CEF-007	Clamper
	37.		Terminal
	38.	BTZ20P060FMC	Screw
	39.		Terminal
	40.		Holder
	41.	YE25FUC	Washer
	42.	CDK-074	Connector
	43.	CNL-530	P.C. Board
	44.		Cover
	45.	CKS-528	Connector
	46.	CDK-073	Connector
	47.	YE15FUC	Washer
	48.		Slide Plate
	49.	CBH-781	Spring
	50.		Holder
	51.	HBA-355	Screw
	52.		Cover
★★	53.	CSN-078	Switch
	54.	HBA-171	Screw
	55.		Terminal
	56.	CKF-072	Terminal
	57.	BMZ30P050FZK	Screw
	58.	BTZ20P060FZK	Screw
	59.		Holder
	60.		Panel
	61.	CXD-520	Quick Release Assy
	62.		Slide Plate
	63.		Frame
	64.	CBH-789	Spring
	65.	WB20FZN	Washer
	66.	BMZ20P025FMC	Screw
	67.	CBH-783	Spring
	68.		Plunger Unit
	69.		Lever
	70.	YE30FUC	Washer
	71.		Holder
	72.		Shaft
★	73.	CXP-042	Solenoid
	74.	BMZ26P030FMC	Screw
	75.		Cover
	76.		Cover
	77.		Holder
	78.	CDK-115	Cord
	79.		Box
	80.		Holder
	81.		Cap
	82.	CDK-274	Connector
	83.		Cap

17.CHASSIS (2) EXPLODED VIEW (FX-K5B/EW)

• Parts List

Mark	No.	Part No.	Description
	1.	CBH-792	Spring
	2.	CMZ30P050FMC	Screw
	3.	CNW-978	Plate
	4.	CNW-976	Plate
	5.	BMZ26P040FMC	Screw
	6.	CWS-220	Display Unit
	7.	CNN-369	Film
★	8.	CAC-826	Button (DIR, BAND/REL)
	9.	CNN-289	Spacer
	10.	CNN-170	Cushion
★	11.	CAC-825	Button
★★	12.	CAC-827	Button (RPT, MEMO)
	13.	CXD-538	Grille Unit
	14.	CNK-281	Grille
	15.	CNW-979	Plate
	16.	CP5210AGLR	FL Tube
	17.	CNN-341	Cushion
	18.	CBA-172	Screw
★★	19.	CSN-092	Switch (Door)
	20.	BPZ20P040FMC	Screw
	21.		Holder
	22.	CNN-171	Cushion
★	23.	CAC-829	Button (DOLBY NR)
	24.	CNN-290	Cushion
★	25.	CAC-829	Button (AUTO/MONO, LOC. S)
★	26.	BG5724K	LED
★★	27.	CSG-212	Switch
★	28.	AA5724K	LED
	29.	CNL-622	P.C. Board
★	30.	CAC-772	Button (0)
★	31.	CAC-775	Button (3)
★	32.	CAC-776	Button (4)
★	33.	CAC-773	Button (1)
★	34.	CAC-774	Button (2)
★	35.	CAC-777	Button (5)
★	36.	CAC-824	Button (VOLUME)
	37.	CNN-168	Cushion
	38.	CNW-824	Lens
	39.	BPZ20P040FMC	Screw
	40.		Holder

Mark	No.	Part No.	Descroption
	41.	YE30FUC	Washer
	42.	CBH-793	Spring
	43.		Lever
	44.		Holder
	45.	CXD-519	Bearing Unit
	46.	CNL-921	P.C. Board
	47.	BPZ20P080FMC	Screw
	48.	CNY-142	Spacer
★	49.	CAC-577	Button (EJECT)
★	50.	CAC-609	Button (Tape)
★	51.	CAC-615	Button (Clear)
★	52.	CAC-608	Button (Tuner)
	53.	CNN-169	Cushion
	54.	CXD-435	Grille Assy
	55.	PTZ20P080FNi	Screw
	56.	CNW-818	Holder
	57.	CAT-220	Door
	58.	CBH-888	Spring
	59.		P.C.Board
	60.	CNL-819	P.C. Board
★★	61.	CEL-165	Lamp
	62.	HBF-120	Washer
	63.	BMZ20P030FBK	Screw
★	64.	CAC-970	Knob
	65.	CWX-576	Audio Control Unit (2/2)
	66.	CKS-212	Plug
★★	67.	CEL-162	Lamp
★★	68.	CSG-212	Switch
★★	69.	CCS-397	Volume (BALANCE)
★★	70.	CCS-332	Volume (BASS, TREBLE)
	71.	CKS-208	Plug
	72.		Frame
	73.	CNM-930	Cover

• Chassis (2) (FX-K5B/EW)

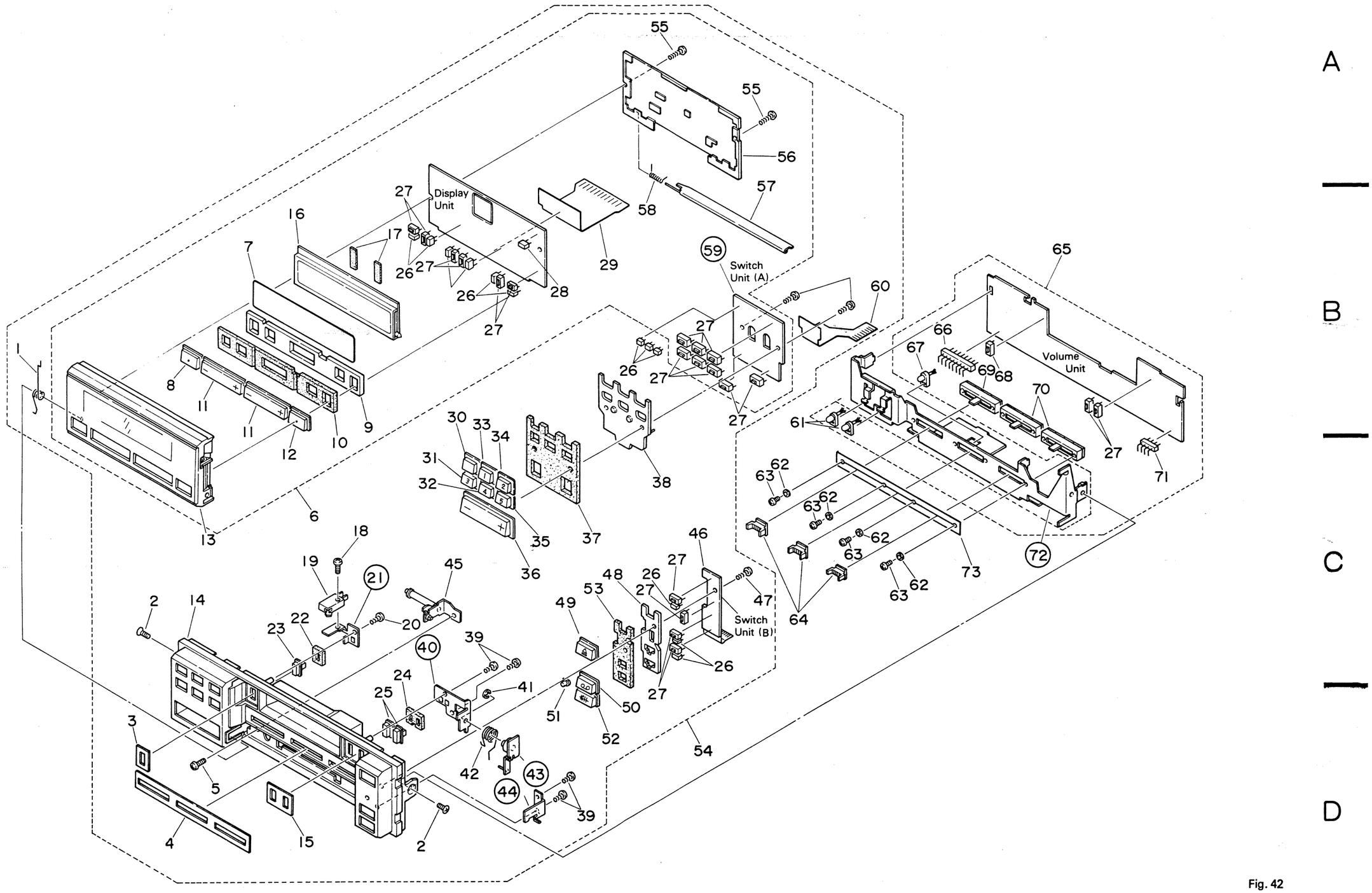


Fig. 42

18.ELCTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*..... RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*..... RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*..... RN2H 0 R 5 K*
1Ω	*010*		*..... RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10¹ ..... RN1/4SR 5 6 2 1 F

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*

FX-K5/EW

Audio Control Unit (CWX-574)
Consists of • Main Unit • Volume Unit • Acc Sense Unit

Audio Control Unit (CWX-574)

MISCELLANEOUS

Mark	Symbol & Description	Part No.
★★	IC1	MB3106M
★★	IC2	HA12047
★★	IC3	TC9154P
★★	IC4	TA75558P
★★	IC5	PA3019
★★	IC6	PD4056A
★★	IC7	PD4054A
★★	Q1, Q2, Q19 – Q24, Q26, Q27, Q30, Q33 – Q36	2SC1740S or 2SC2458
★★	Q5 – Q8, Q11, Q12, Q15, Q16, Q25, Q404	2SA933S or 2SA608SP
★★	Q9, Q10	2SC3113
★★	Q13, Q14	2SA838 or 2SA1005
★★	Q28	2SC2060
★★	Q29	2SA934
★★	Q31	2SD1055F
★	Q32, Q407, Q408	2SC1740S
★	D1 – D4, D8 – D12, D20 – D30, D32, D35, D37, D38, D40, D42	1SS133 or 1SS176
★	D9	1SS133
★	D13, D33	MTZ6R8JA or MTZ6R2JC
★	D14, D34	ERA15-02
★	D16 – D18, D31	MTZ4R7
★	D19, D39	MTZ5R6JBC
★	D36	MTZ8R2JC or HZS8R2JB2
★	D43	MTZ6R2B

Mark	Symbol & Description		Part No.
	L1	Transformer	CTX-073
	L2	Ferri Inductor	CTF-156
	IB1		CWW-219
	IB2, IB3		CWW-238
★★	S1 – S3	Switch	CSG-212
★★	VR1, VR2	Semi-fixed, 470Ω(B)	CCP-237
★★	VR3, VR4	Volume, 25 kΩ(B)	CCS-332
★★	VR5	Volume, 10 kΩ(AB)	CCS-397
	X2	Crystal	CSS-029
★★	IL2	Lamp	CEL-162
★★	IL3, IL4	Lamp	CEL-165
★★	FU1	Fuse	CEK-058

RESISTORS

Mark	Symbol & Description	Part No.
	R132, R133, R168, R170, R183, R503, R504	RD1/2PS□□□JL
	R417	RD1/2PS□□□J
	Other Resistors	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2	CKPYB391K50L
	C3, C4, C25, C26	CEANL4R7M35LL
	C5, C6, C107, C108	CEA220M16L2
	C9, C10	CQMA223J50L
	C11, C12, C17, C124, C125	CEA221M10L2
	C13 – C16, C19, C20, C41, C42	CEAR47M50NPLL
	C18, C21, C22, C40, C123	CEA101M10L2
	C23, C24, C43, C44, C133, C134	CEA100M16L2
	C27, C28	CQMA472J50L
	C29, C30, C128	CEA010M50L2
	C31, C32	CQMA183J50L
	C33, C34	CEAR22M50L2
	C35, C36	CEAR68M50LL
	C37, C38	CQMA333J50L
	C39, C70	CEA470M16L2
	C51, C52	CKPYX682M16L
	C53, C54, C101 – C106	CQMA473J50L
	C55, C56, C109	CCPSL330J50L
	C57, C69	CEA470M16LS
	C58	CEA101M10LL
	C59 – C62, C65, C66	CEA100M25LS
	C63, C64	CKPYB102K50L
	C67	CKPYB471K50L
	C110, C150 – C155, C305 – C307	CKPYX222M16L
	C111	CEAR15M50LS2
	C112	CQMA392J50LL
	C113	CEA4R7M35LS
	C114, C115, C120, C158	CQEA473J50
	C116, C117	CEA101M35L2
	C118, C126 470μF/16V	CCH-114
	C119, C121, C122	CCDCH330J50L
	C129	CEAR22M50LS
	C135	CQMA473J50L
	C136	CEA100M16L2
	C137	CEA4R7M25L2
	C501	CCDCH220J50

FX-K5B/EW

Audio Control Unit (CWX-576)
Consists of • Main Unit • Volume Unit • Quick Release Unit • Acc Sense Unit

Audio Control Unit (CWX-576)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		MB3106M
★★	IC2		HA12047
★★	IC3		TC9154P
★★	IC4		TA75558P
★★	IC5		PA3019
★★	IC6		PD4056A
★★	IC7		PD4054A
★★	Q1, Q2, Q19 – Q22, Q26, Q27, Q30, Q33 – Q36, Q301, Q304 – Q306, Q308		2SC1740S or 2SC2458
★★	Q5 – Q8, Q11, Q12, Q16, Q25, Q302, Q303, Q307, Q404		2SA933S or 2SA608SP
★★	Q9, Q10		2SC3113
★★	Q13, Q14		2SA838 or 2SA1005
★★	Q15		2SA933S
★★	Q28		2SC2060
★★	Q29		2SA934
★★	Q31		2SD1055F
★★	Q32, Q407, Q408		2SC1740S
★	D1 – D4, D8, D10 – D12, D20 – D30, D32, D35, D37, D38, D41, D42, D301 – D303, D305 – D307		1SS133 or 1SS176
★	D9		1SS133
★	D13, D33		MTZ6R8JA or MTZ6R2JC
★	D14, D34		ERA15-02
★	D16 – D18, D31		MTZ4R7
★	D19, D39		MTZ5R6JBC
★	D36		MTZ8R2JC or HZS8R2JB2
★	D43		MTZ6R2B
★	D304		HZ4LLC
	L1	Transformer	CTX-073
	L2	Ferri-Inductor	CTF-156
	IB1		CWW-219
	IB2, IB3		CWW-238
★★	S1 – S3	Switch	CSG-212
★★	VR1, VR2	Semi-fixed, 470Ω(B)	CCP-237
★★	VR3, VR4	Volume, 25 kΩ(B)	CCS-332
★★	VR5	Volume, 10 kΩ(AB)	CCS-397
	X2	Crystal	CSS-029
★★	IL2	Lamp	CEL-162
★★	IL3, IL4	Lamp	CEL-165
★★	FU1	Fuse	CEK-058

RESISTORS

Mark	Symbol & Description	Part No.
	R132, R133, R168, R170, R183, R503, R504	RD1/2PS□□□JL
	R417	RD1/2PS□□□J
	Other Resistors	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2	CKPYB391K50L
	C3, C4, C25, C26	CEANL4R7M35LL
	C5, C6, C107, C108	CEA220M16L2
	C9, C10	CQMA223J50L
	C11, C12, C17, C124, C125	CEA221M10L2
	C13 — C16, C19, C20, C41, C42	CEAR47M50NPLL
	C18, C21, C22, C40, C123	CEA101M10L2
	C23, C24, C43, C44, C133, C134	CEA100M16L2
	C27, C28	CQMA472J50L
	C29, C30, C128	CEA010M50L2
	C31, C32	CQMA183J50L
	C33, C34	CEAR22M50L2
	C35, C36	CEAR68M50LL
	C37, C38	CQMA333J50L
	C39, C70	CEA470M16L2
	C51, C52	CKPYX682M16L
	C53, C54, C101 — C106	CQMA473J50L
	C55, C56, C109	CCPSL330J50L
	C57, C69	CEA470M16LS
	C58	CEA101M10LL
	C59 — C62, C65, C66	CEA100M25LS
	C63, C64	CKPYB102K50L
	C67	CKPYB471K50L
	C110, C150 — C155, C305 — C307	CKPYX222M16L
	C111	CEAR15M50LS2
	C112	CQMA392J50LL
	C113	CEA4R7M35LS
	C114, C115, C120, C158	CQEA473J50
	C116, C117	CEA101M35L2
	C118, C126 470 μF/16V	CCH-114
	C119, C121, C122	CCDCH330J50L
	C129	CEAR22M50LS
	C135	CQMA473J50L
	C137	CEA4R7M25L2
	C156, C157	CKPYB102K50L
	C500	CCG-081
	C501	CCDCH220J50

S Unit

Mark	Symbol & Description	Part No.
★★	Q601	2SC2458
★	D601	MTZ6R2JB
★	R601 — R603	RD1/4PS□□□JL
★	C601	CQMA103J50L

Switch Unit (A)

Mark	Symbol & Description		Part No.
★	D1 — D3	LED	BG5724K
★★	S4 — S11	Switch	CSG-212

Switch Unit (B)

Mark	Symbol & Description		Part No.
★★	S18 — S21	Switch	CSG-212
★	D1 — D3	LED	BG5724K

Display Unit

Mark	Symbol & Description		Part No.
★★	IC8		PD7005
★	D401	LED	AA5724K
★	D402 — D407	LED	BG5724K
★★	S12 — S17	Switch	CSG-212
★	FL Tube	(FX-K5/EW, FX-K5B/EW)	CP5210AGLR
★	FL Tube	(FX-K5SDK/WG)	CP5206AGLR
	R401 — R421	Chip Resistor (FX-K5/EW, FX-K5B/EW)	RS1/8S□□□J
	R401 — R416, R418 — R421	Chip Resistor (FX-K5SDK/WG)	RS1/8S□□□J
	C401	Chip Capacitor	CCSCH101J50

Plunger Unit (FX-K5B/EW)

Mark	Symbol & Description	Part No.
★★	Q1	2SC2458
★	D1, D2	1S2473 or 1S1555
	R1	RD1/6PS563J
	C1	CEA470M16LS

Switch P.C. Board

Mark	Symbol & Description		Part No.
★★	S1	Switch (CST SET)	CSN-089
★★	S2, S3	Switch (CST IN, 70 μs)	CSN-091
★	MR1, MR2	Magnetic Resistive device	SDME106A

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1 — D3	1S1555

Miscellaneous Parts List

Mark	Symbol & Description		Part No.
★★	Head Unit		CXD-758
★★	S18	Switch (Door)	CSN-092
★★	M1	Motor (Head)	CXM-452
★★	M2	Motor (Gear)	CXM-351
★★	M3	Motor (Capstan)	CXM-161

RESISTORS

Mark	Symbol & Description	Part No.
	R132, R133, R168, R170, R183, R503, R504	RD1/2PS□□□JL
	R417	RD1/2PS□□□J
	Other Resistors	RD1/4PS□□□JL

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2	CKPYB331K50L
	C3, C4, C25, C26	CEANL4R7M35LL
	C5, C6, C107, C108	CEA220M16L2
	C9, C10	CQMA223J50L
	C11, C12, C17, C124, C125	CEA221M10L2
	C13 – C16, C19, C20, C41, C42, C301	CEAR47M50NPLL
	C18, C21, C22, C40, C123	CEA101M10L2
	C23, C24, C43, C44, C133, C134	CEA100M16L2
	C27, C28	CQMA472J50L
	C29, C30	CEA010M50L2
	C31, C32	CQMA183J50L
	C33, C34	CEAR22M50L2
	C35, C36	CEAR68M50LL
	C37, C38	CQMA333J50L
	C39, C70	CEA470M16L2
	C51, C52	CKPYX682M16L
	C53, C54, C101 – C106	CQMA473J50L
	C55, C56, C109	CCPSL330J50L
	C57, C69	CEA470M16LS
	C58	CEA101M10LL
	C59 – C62, C65, C66	CEA100M25LS
	C63, C64	CKPYB102K50L
	C67	CKPYB471K50L
	C110, C150 – C155, C305 – C307	CKPYX222M16L
	C111	CEAR15M50LS2
	C112	CQMA392J50LL
	C113	CEA4R7M35LS
	C114, C115, C120, C158	CQEA473J50
	C116, C117	CEA101M35L2
	C118, C126 470μF/16V	CCH-114
	C119, C121, C122	CCDCH330J50L
	C129	CEAR22M50LS
	C135	CQMA473J50L
	C136	CEA100M16L2
	C137	CEA4R7M25L2
	C302 – C304	CKPYY103M16L
	C501	CCDCH220J50

FX-K5SDK/WG

Audio Control Unit (CWX-575)
Consists of • Main Unit • Volume Unit • Acc Sense Unit

Audio Control Unit (CWX-575)

MISCELLANEOUS

Mark	Symbol & Description		Part No.
★★	IC1		MB3106M
★★	IC2		HA12047
★★	IC3		TC9154P
★★	IC4		TA75558P
★★	IC5		PA3019
★★	IC6		PD4056A
★★	IC7		PD4054A
★★	Q1, Q2, Q18 – Q24, Q26, Q27, Q30, Q32 – Q36, Q407, Q408		2SC1740S or 2SC2458
★★	Q5 – Q8, Q11, Q12, Q15 – Q17, Q25, Q404		2SA933S or 2SA608SP
★★	Q9, Q10		2SC3113
★★	Q13, Q14		2SA838 or 2SA1005
★★	Q28		2SC2060
★★	Q29		2SA934
★★	Q31		2SD1055F
★	D1 – D4, D6 – D12, D15, D20 – D30, D32, D35, D37, D38, D40, D42		1SS133 or 1SS176
★	D13, D33		MTZ6R8JA or MTZ6R2JC
★	D14, D34		ERA15-02
★	D16 – D18, D31		MTZ4R7
★	D19, D39		MTZ5R6JBC
★	D36		MTZ8R2JC or HZS8R2JB2
★	D43		MTZ6R2B
	L1	Transformer	CTX-073
	L2	Ferri-Inductor	CTF-156
	IB1		CWW-219
	IB2, IB3		CWW-238
★★	S1 – S3	Switch	CSG-212
★★	VR1, VR2	Semi-fixed, 470Ω(B)	CCP-237
★★	VR3, VR4	Volume, 25 kΩ(B)	CCS-332
★★	VR5	Volume, 10 kΩ(AB)	CCS-397
	X2	Crystal	CSS-029
★★	IL2	Lamp	CEL-162
★★	IL3, IL4	Lamp	CEL-165
★★	FU1	Fuse	CEK-058

19.PACKING METHOD (FX-K5/EW, FX-K5SDK/WG)

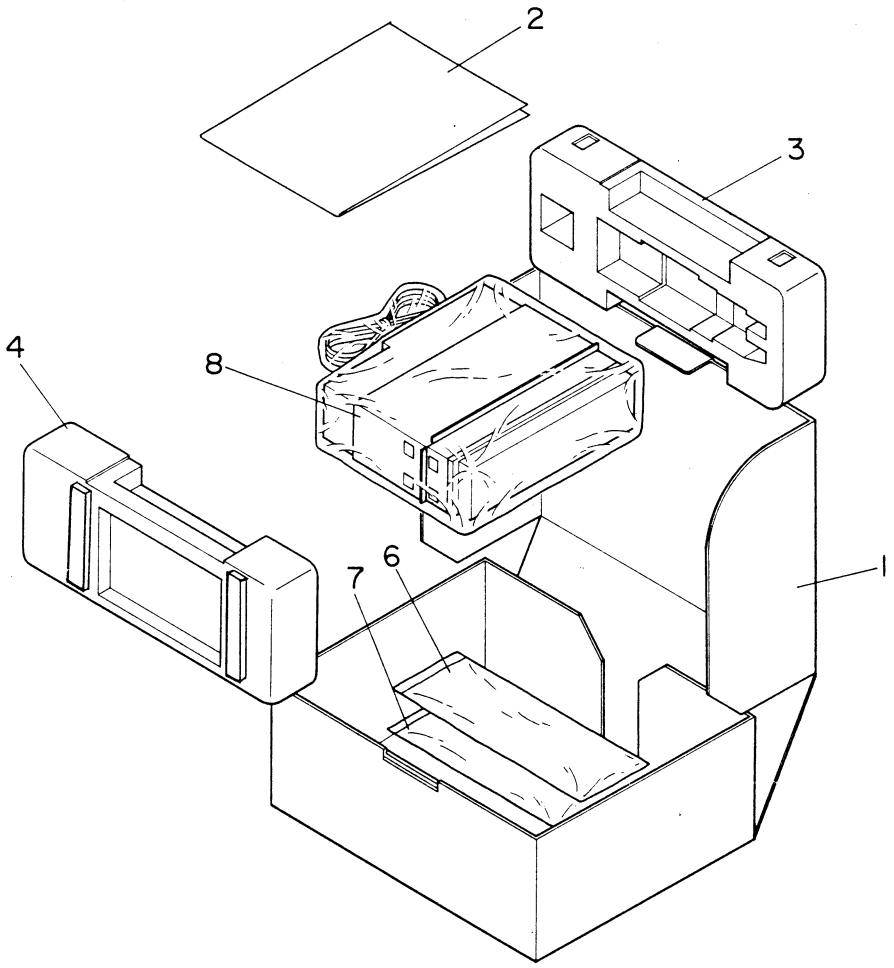


Fig. 43

• Parts List

Mark	No.	Part No.	Description
	1.	CHF-181	Carton (EW)
		CHF-183	Carton (SDK/WG)
	2.	CRD-530	Owner's Manual (EW) (English, French, German, Spanish)
		CRD-531	Owner's Manual (EW) (Swedish, Norwegian, Dutch, Italian)
		CRD-532	Owner's Manual (SDK/WG) (German, French)
			Card
	3.	CHF-153	Styrofoam
	4.	CHF-154	Styrofoam
	5.	VACANT	
	6.	CEA-885	Accessory Kit
	6-1.	CDE-437	Cord
	6-2.	CNF-111	Strap
	6-3.	CNF-382	Lever
	6-4.	CNW-642	Holder
	6-5.		Screw Assy
	6-5-1.	CBA-028	Screw for Strap
	6-5-2.	NF40FMC	Nut
	6-5-3.	NF50FMC	Nut
	6-5-4.	PMB50Y160FMC	Screw
	6-5-5.	WS40FMC	Washer
	7.	CNW-757	Holder
		CNB-793	Panel
	8.	CNG-223	Holder

20. PACKING METHOD (FX-K5B/EW)

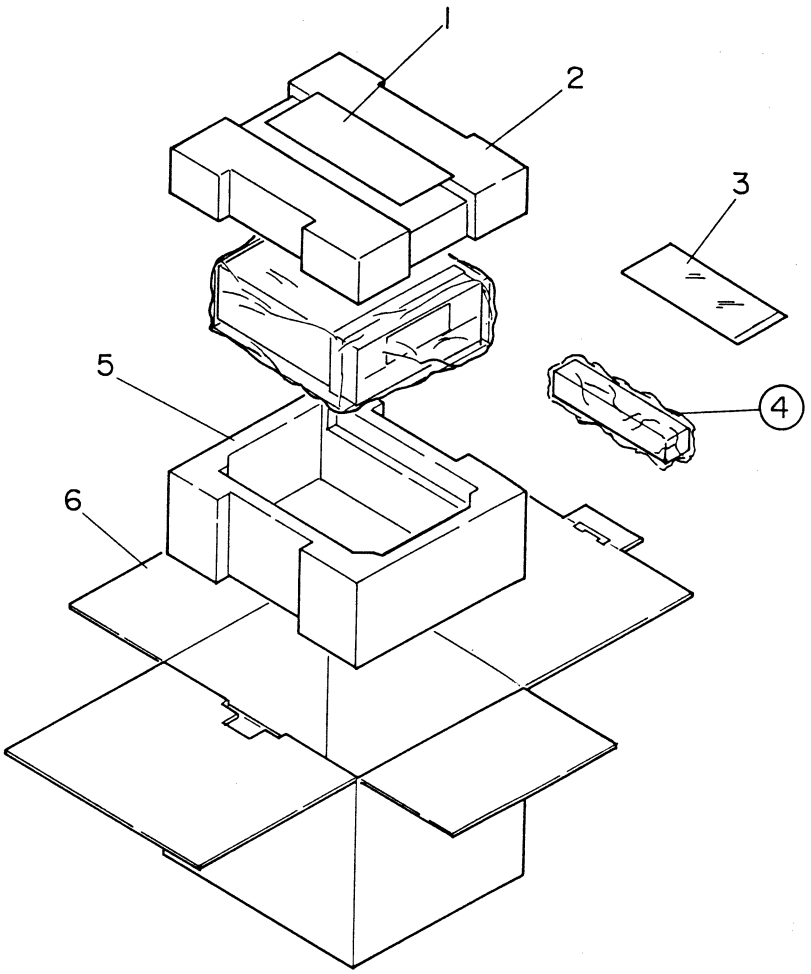


Fig. 44

• Parts List

Mark	No.	Part No.	Description
	1.	CRD-533	Owner's Manual (English, French, Italian, Spanish) Card
	2.	CHD-573	Styrofoam
	3.	CEA-986	Accessory Kit
	3-1.	CDE-437	Cord
	3-2.	CNF-111	Strap
	3-3.	CEA-892	Gear Assy
	3-4.		Screw Assy
	3-4-1.	CBA-028	Screw for Strap
	3-4-2.	CBA-102	Screw
	3-4-3.	NF40FMC	Nut
	3-4-4.	NF50FMC	Nut
	3-4-5.	WS40FMC	Washer
	4.		Cover
	5.	CHD-572	Styrofoam
	6.	CHD-948	Carton